

# Letter of Interest



Submitted to:



**RF-LOI# 2019-01**

## **Water and Wastewater System Acquisition**

**September 16, 2019**





Submitted to:



## Letter of Interest

**RF-LOI# 2019-01**

# Water and Wastewater System Acquisition

**September 16, 2019**

**Veolia Contact:**

Mr. Mark Sanderson, Vice President of Major Projects

Veolia Water North Operating Services, LLC

53 State Street, 14th Floor, Boston, MA 02109

Telephone: 719/332-4184 – Email: [mark.sanderson@veolia.com](mailto:mark.sanderson@veolia.com)

The information contained on each page of this document which has been stamped with the legend "Company Confidential – Proprietary Information – Veolia" is confidential and proprietary information of Veolia Water North America Operating Services, LLC and Veolia North America, Inc. (Veolia). Veolia asserts a business confidentiality claim covering all data and information contained on each page of this document bearing this legend as well as information submitted in the separate sealed envelope. No such data and information shall be disclosed outside of the agency to which this document has been submitted or be duplicated, used or disclosed, in whole or in part, for any purpose other than to evaluate this document.





September 16, 2019

Mr. Wayne Martin, Chief Engineer  
City of Harrisburg - Office of City Engineer  
123 Walnut Street, Suite 212, Harrisburg, PA 17101  
(Submitted by email: [wsmartin@harrisburgpa.gov](mailto:wsmartin@harrisburgpa.gov) –  
as a PDF file: Veolia RFP 2019-0\_\_ RFLOI Documents)

**Subject: Letter of Interest - RD-LOI#2019-01 - Water and Wastewater System Acquisition**

Dear Mr. Martin:

**Veolia Water North America Operating Services, LLC** (Veolia) is pleased to present our Letter of Interest and supporting Attachments, which document our capabilities and approach for developing and delivering a long-term agreement with the City for the acquisition of your water and wastewater system (System) under the proposed agreement.

We have carefully considered your request for Letter of Interest and appreciate the importance of engaging all community stakeholders, including those currently involved in the management and operations of the facilities, to build support for this important initiative. We understand that the City seeks to build upon the progress already achieved by the municipal authority in managing and operating these assets, while reducing and controlling costs borne by the ratepayers.

This proposed new concession agreement will mark the next step in this process and one that will be critical to achieving the goals that you have outlined for this process. We stand ready to support you in that endeavor.

Veolia also understands that the City is considering a variety of project models, including a long-term Concession lease or similar transaction for the operations and management of your water and wastewater systems. The types of benefits that the City is seeking to realize under this new partnership include maintaining high quality water supply and efficient wastewater and stormwater treatment operation while also achieving long-term rate stabilization and improved customer service, as well as enhanced environmental quality benefits.

Veolia has considerable experience in working with communities like yours to build support for initiatives of this type, most especially in the areas where we can add value. An example would be in addressing issues such as assertions that rates will increase, employees will lose their jobs and/or the quality of service would decrease, when the opposite has been true in our experience.

As the leader in providing comprehensive operations, maintenance management and ownership approaches for utilities in the U.S. and throughout the world, Veolia is prepared to work with the City of Harrisburg to develop and implement the best solution for your water customers and other stakeholders in the water system. In North America, our firm has operations partnerships with more than 200 municipal clients, with responsibility for managing 89 water systems that supply more than 733.7 million gallons a day of potable to meet the needs of 4.2 million people, and in processing over 1.7 billion gallons a day of wastewater flows to meet the needs of more than 5.8 million people.

Veolia also recognizes the key challenges that this type of transaction will represent, and we have identified **Meridiam**, a global developer and asset manager of public infrastructure, as our financial and development partner to work with us through the potential development of this opportunity.

Meridiam has significant experience in the development and financing of major utility and public works projects. This firm is currently managing \$6.8 billion of assets and has been named preferred bidder or reached financial close on more than 70 projects in 20 different countries worldwide for a total project financing exceeding \$50 billion.



Meridiam's ultimate role in this project would be to structure the financing for the upfront payment for the City of Harrisburg's Water and Wastewater System, and then remain as a long-term and active asset manager in partnership with Veolia. Meridiam's approach to developing the financing structure for the project will be based on a detailed understanding of the City's goals and objectives. Based on the material provided in your request for Letters of Interest, we understand the City is seeking to generate an upfront capital sum, address key system deficiencies, and reduce the costs borne by ratepayers. Given this understanding, we would likely fund the upfront payment, to be paid at closing, with equity capital as well as non-recourse debt.

Typically, Meridiam will run an open funding competition, creating competitive tension between the various potential financing sources in order to obtain the most competitive cost of capital. They would then select the debt solution that will provide the best value for money based on prevailing market conditions, while at the same time aiming to deliver funding certainty, low execution risk, flexibility, and an expeditious financial close. The debt options considered will be taxable bond solutions, bank debt and Federal loan programs.

We have prepared this Letter of Interest with a set of Attachments, beginning with an Introduction that profiles the capabilities and key experience that Veolia and Meridiam will bring to this project, including:

- Introduction – Part 1 – Operational History and Proof of Financial Ability to Manage the System – In this attachment we document the base of financial resources that Veolia in North America, backed by the global resources of our global parent, bring to this proposed new transaction. We also profile the financial capabilities of our partner, Meridiam, and the range of resources they offer and type of financial transactions they have been engaged with.
- Introduction – Part 2 – References – For the purposes of this submittal, we have selected key experience that Veolia offers on comparable water and wastewater projects with operations and characteristics similar to your water system. This includes a number of water and wastewater systems that our company has operated and managed under a variety of models, some of which have involved concession agreements and payments, as well as contracts where we work with private owners who hold long-term (up to 30 years) agreements with public agencies similar to the City of Harrisburg.

As this experience shows, Veolia meets and exceeds the core experience requirement of operating public water and wastewater utilities that are comparable in size and operations requirements to those of your community. Added to these, Veolia's experience history includes operating some of the largest water and wastewater operations in the U.S. This includes an almost decade long water operations, maintenance and management (O&M) contract with the **City of Indianapolis, Indiana**. That water system serves the needs of almost one million people in and around the City, and that contract also involved managing the customer service operations and a large-scale capital program. In the area of wastewater operations, we currently have O&M responsibility for two of the largest wastewater operations in the U.S., that with the **City of Milwaukee, Wisconsin**, and that with the **Downriver Utility Wastewater Authority (DUWA), Michigan**.

Veolia's 20-year contract with the Milwaukee Metropolitan Sewerage District (MMSD) ranks as the single largest municipal wastewater O&M contract in the U.S. The MMSD's 420-square-mile service area includes 18 municipalities and all or part of 10 municipalities in the surrounding counties of Ozaukee, Washington, Waukesha and Racine, meeting the wastewater needs of more than 1.1 million people. The system includes two wastewater treatment plants (300- and 320-MGD), an extensive sewer and stormwater management system, as well as a biosolids beneficial use operations for the production of the Millorganite product.

The DUWA systems ranks as the second largest wastewater system in Michigan, serving a population base of more than 350,000 in a service area composed of 13 member communities. The agency worked with Wayne County on an asset transfer of the Downriver Sewage Disposal System. As part of that process, DUWA selected Veolia as their operations partner in 2018. This new project involves providing O&M of wastewater facilities, as well as the development of capital planning recommendations. The wastewater treatment plant, located in the City of Wyandotte, is served by approximately 63 miles of interceptor pipe that is used to convey wastewater from 13 tributary communities and several Drainage Districts that operate wet weather storage facilities in the Service Area. The 225-MGD plant has the capacity to provide primary treatment for up to 150-MGD, and capacity to provide secondary treatment for up to 125-MGD. The wastewater plant



treatment process consists of influent pumping, preliminary treatment, primary treatment, secondary treatment (high-purity oxygen activated sludge with secondary settling), and UV disinfection. Treated effluent is discharged to the Trenton Channel of the Detroit River. The system also includes a 15 million gallon wet weather storage tunnel that is used to retain excess wet weather flows during rain events.

We have also prepared the other Attachments, as listed in your request for Letter of Interest, including:

- Attachment 1 - A listing of Veolia's water and wastewater facilities included in our portfolio of work in the State of Pennsylvania and other parts of the region.
- Attachment 2 - As we noted earlier in this letter, Veolia operates almost 300 municipal water and wastewater plants in North America, and from that group we have selected a sampling of Annual Reports/Executive Summary providing operating data summaries for these facilities and Capital Improvements Plans for these operations.
- Attachment 3 - In this Attachment we provide resumes for Key Staff, a Project Manager and Project Director, who are typical of the types of professionals that we would assign to this project. At the Proposal stage of this process, Veolia will prepare a detailed organization chart showing the key management, technical and other resources that would be required for this operation. Additionally, as this initiative proceeds to the Proposal stage, we will expand our team to include other engineering and construction partners to meet the project specific needs for this new long-term agreement.
- Attachment 4 - Veolia has also worked with many of our 210 municipal client to address Combined Sewer Overflow (CSO) planning and management (Nine Minimum Controls Plan). In this attachment we present work examples from representative wastewater operations. These work examples cover strategy planning, implementation and review.
- Attachment 5 - At a number of our firm's more than 200 municipal wastewater operations, Veolia has worked with our clients on the development of MS4 Applications. In this Attachment we provide an example of an application that was prepared for one of our wastewater operations.

This serves as the official letter transmitting our complete response, which is being submitted electronically to the City Engineer, describing our interest in and our firm's operational and financial ability to effectively manage the City of Harrisburg's water, wastewater and stormwater systems.

The name and address of our company and contact person is provided below:

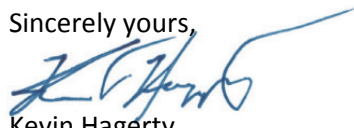
Mr. Mark Sanderson, Vice President - Major Projects  
Veolia Water North America Operating Services, LLC  
53 State Street, 14th Floor, Boston, MA 02109  
Telephone: 719/332-4184 - Email: mark.sanderson@veolia.com

Mr. Sanderson can address any questions and provide any additional information that you may need in connection with this Letter of Interest.

In closing, we would note that Veolia is a limited liability company (LLC) under the laws of the State of Delaware, and an authorized service provider in the State of Pennsylvania. Further, in submitting this Letter of Interest we understand that this is not a Bid, and not to be construed as an official and customary request for bids or request for proposals. We also understand that this Letter of Interest will be considered confidential in compliance with the provisions of the Pennsylvania Right to Know Law, 65 P.S. § 67.101, et seq. - to be opened and reviewed by the review committee only.

We look forward to the opportunity of working closely with the City as your consideration of this important initiative moves forward.

Sincerely yours,



Kevin Hagerty  
Senior Vice President

Attachments:

- Introduction - Parts 1 and 2
- Attachments - 1 through 5

# INTRODUCTION

## **Part 1: Operational History and Proof of Financial Ability to Manage the System**

## Introduction – Part 1:

### Operational History and Proof of Financial Ability to Manage the System

#### Introduction

**Veolia Water North America Operating Services, LLC** (Veolia) is the Respondent to the Request for Letter of Interest (RFI) issued by the **City of Harrisburg, Pennsylvania**, for this proposed new partnership for developing and delivering a long-term agreement for the acquisition of your water and wastewater system (System) under the proposed Acquisition agreement.

Joining with Veolia will be **Meridiam**, a leading infrastructure development and investment firm, who would be a potential financial and development partner for the delivery of any Concession agreement that may ultimately result from this process.

We understand that the City has initiated this process with the goal of improving water supply, wastewater and stormwater treatment operation. Under the current operations structure water, wastewater and stormwater services are provided by a Municipal Authority, Capital Region Water (CRW), that acts as the sole owner and operator of the system through a series of agreements, with a transition to sole operational functions commencing in 2013.

Through this new procurement process, starting with this Letter of Interest, we understand that the City is seeking to build upon the progress achieved by CRW and to reduce the costs borne by ratepayers. This will not be an operate-and-maintain type of relationship with the City (or the municipal authority), but rather a transaction to take full ownership of the water, wastewater and stormwater assets and all related obligations.

The goal of this process then will be to identify a firm (or team) that would be capable of undertaking the ownership and operational control of all assets, liabilities and obligations associated with the services required of CRW. This would include the development of a Concession type agreement for the transfer of the utility operations, including water storage, treatment and distribution; all sewer-related infrastructure and services; and all stormwater-related infrastructure and services.

The contemplated offering would include all assets, liabilities and obligations associated with an independent and combined stormwater-wastewater treatment operation, any conveyance, and pumping, as well as all aspects of the water, sewer and storm-water operations. Other responsibilities would include billing, administration and engineering services.

In this Attachment we provide the information requested to demonstrate that Veolia, with Meridiam, provides the overall capacity, experience and expertise needed to successfully acquire and operate the systems under a proposed Concession type of agreement.

#### **Veolia Water North America Operating Services, LLC - Respondent**

Veolia, the Respondent, has the corporate resources, administrative staff and operational personnel necessary to provide all of the required management, operations, financial and support services associated with operation and management of the System.

Our firm has more than a century of work in the State of Pennsylvania, providing engineering, construction and long-term operations, maintenance and management (O&M) services to municipal clients similar to the City of Harrisburg, and we have some 11 current municipal clients for whom we operate water and wastewater systems under regulatory standards that are similar to your water and wastewater systems.



The City of Harrisburg's wastewater system serves ~17,000 active connections in the City as well as customers from the surrounding suburban communities, with average daily wastewater flows are approximately 20.9-MGD. These wastewater assets include: a 45-MGD Advanced Wastewater Treatment Facility; five sewer pump stations; 36 miles of sanitary sewers; 40 miles of stormwater sewers; and 101 miles of combined sanitary and stormwater sewers. The City has two water sources, including a 22 square mile watershed and a secondary water source (the Susquehanna River), providing a combined 1.9 billion gallons annually to the 20,300 active meter connections in the City and surrounding suburban communities. The water assets include: the six billion gallon capacity DeHart Dam and Reservoir; the 30-MGD pumping capacity Susquehanna River Intake; the 20-MGD Dr. Robert E. Young WSCF; two reservoirs (26 MG); three pump stations; 250 miles of water distribution line; 1,800 fire hydrants; 5,370 main valves; and 20,330 service valves.



This work, as the summary graphic (opposite) shows, includes operations responsibility for 210 municipal wastewater plants that treat more than 1.7 billion gallons of flow each day to meet the needs of over 5.4 million people, along with 89 municipal water treatment plants that supply potable water to more than 4.7 million people.

Veolia in North America is also part of a global services provider, Veolia Environnement, S.A., which has a more than 166-year history working with governmental and commercial clients, and today provides over 95 million people with drinking water and more than 63 million people with wastewater service.

Veolia also has the financial resources and strength that will be required to deliver on commitments under any new partnership with the City of Harrisburg. In 2017, Veolia's consolidated businesses in the U.S. generated over \$2.6 billion in revenue, and the company had more than \$3.4 billion in assets.

Our global parent company, Veolia Environnement, S.A., recognized consolidated revenues of more than \$30.1 billion in 2018. Our company also maintains investment grade credit ratings from Moody's – Baa1/P-2 Stable – and Standard and Poor's – BBB/Stable/A-2 – further demonstrating the financial strength that will be needed to support this proposed concession type of agreement with the City of Harrisburg.

Veolia has also been engaged in concession and ownership types of agreements, working directly with municipalities such as yours and with private owners that have been engaged in the purchase/transfer of water and wastewater systems under long-term agreements.

Nationally, our company's acquisitions experience traces its history back to a pioneering project in **Franklin, Ohio**. In 1987, the Miami Conservancy District (the wastewater utility) selected Veolia to provide O&M services for the Franklin Area Wastewater Treatment Plant.

In 1995, the Franklin facility was sold by the Miami Conservancy District to Veolia, marking the nation's first transition of a municipally owned wastewater treatment plant to private ownership. This public-private partnership was part of a U.S. Environmental Protection Agency (U.S. EPA) pilot program for the private ownership of federally and California state-funded municipal wastewater treatment facilities. This transaction marked the first U.S. EPA and Office of Management and Budget (OMB) approved transaction under Presidential Executive Order 12803. The asset purchase provided defeasance of existing municipal bonds, with net proceeds to be used for infrastructure and tax reduction. Veolia originally acquired the Franklin wastewater facility for \$6.8 million and owned and operated that facility under a 20-year term. This new contract immediately reduced annual wastewater treatment expenses by 14%.

In 2015 that agreement was renewed for a new term. As part of this long-term contract, Veolia is responsible for investing in capital improvements and expansions of this facility, as needed to accommodate future growth. Some of the accomplishments of this project include performance recognitions, including the prestigious National Council for Public-Private Partnerships' Project Award;

## VEOLIA IN NORTH AMERICA



630  
Communities served



7,975  
Employees



206  
Municipal clients



131  
Industrial/Commercial clients



WATER



1.8 BGD  
wastewater treatment  
capacity managed



1.05 BGD  
water treatment  
capacity managed



180,510 DTPY  
biosolids processed  
(dry tons per year)



9,235 miles  
underground water  
assets managed  
6,442 miles water lines  
2,793 miles sewer lines



399  
water & wastewater  
facilities managed  
89 municipal water  
210 municipal  
wastewater  
20 industrial/  
commercial water  
80 industrial/  
commercial wastewater



18.5M  
population served  
4.7M water  
5.4 M wastewater  
15.1 M biosolids



ENERGY



583.8 MW  
electricity generation  
capacity



12.8 M lbs/hr  
steam production  
capacity



402 MMBTU/hr  
hot water production  
capacity



212,969 tons  
chilled water production  
capacity



26  
district energy  
facilities managed



137 miles  
underground energy  
distribution systems  
managed

### VEOLIA ENVIRONNEMENT

\$30.1 billion  
revenue

171,000  
employees



WATER

100 million  
people supplied  
with drinking water

4,052  
drinking water treatment  
plants managed



ENERGY

44 million  
MWh  
produces

2,086  
industrial sites  
managed



WASTE

39.6 million  
people provided  
with collection services  
on behalf of municipalities

737,970  
business customers



Veolia's ownership and management of the municipal wastewater treatment plant at **Franklin, Ohio**, has been highly successful and was recognized with a Project Award, National Council for Public-Private Partnerships.

*"... thank you for the excellent service you have provided... you have always acted quickly to resolve any issues and take the necessary steps to prevent future issues. I appreciate your ease of communication... It allows me to be confident that the plant is always being operated in a most effective way. I look forward to continuing this partnership!"*

– Cheryl Shields, Administrator,  
Franklin Regional Wastewater Treatment Corporation

complete responsibility for all facility maintenance and capital projects; integration of automated SCADA control into the facility to replace paper flow charting; and 20 years without a lost-time incident or OSHA-recordable injury.

In other examples of our firm's key acquisition experience, Veolia is currently working as the O&M contractor to a private owner (Rialto Water Services), which has a 30-year concession agreement with the **City of Rialto, California**, for the ownership, operation and management of their water and wastewater utility.

Veolia has other concession and similar types of agreements with communities such as the **City of Cranston, Rhode Island**. Under that contract, Veolia worked with the City (as the owner of the wastewater utility) to change a traditional O&M contract to a utility privatization approach under a lease-management agreement with a 30-year term. That contract includes responsibility for capital planning and upgrades and long-term renewals and replacement of assets in a "full risk" model where Veolia is responsible for managing all operating and capital costs.

In 1989, the City first selected Veolia to provide full-service O&M for their wastewater system, including: a 20.2-MGD activated sludge wastewater plant; 250 miles sanitary/storm collection system; 22 lift stations; and a revenue generating merchant biosolids operation, including incinerators that process a combined total of 66 dry tons per day of sludge today from the City's plant and other area.

In 1997, the scope of this contract was transitioned under a 25-year lease transaction (later extended to 30 years) covering the City's entire wastewater treatment system. Veolia paid an up-front \$48 million concession fee and funded \$27 million in capital project work, including a DBO upgrade to the treatment plant using a turnkey design/build/operate (DBO) type approach.

Veolia and the City broke new ground when they implemented this transaction, which was considered to be a landmark Public-Private Partnership at the time. A 2001 contract amendment extended the term of this lease transaction for another five years, and Veolia paid an additional \$3.1 million concession fee as part of that contract extension.

Other examples of Veolia's experience with privative ownership and financing projects include:

- **Metropolitan Water Reclamation District of Greater Chicago, Illinois** - Biosolids Plant at the Stickney Wastewater Treatment Plant - This contract, a Design/Build/Finance/Own/Operate (DBFO) contract for a 150-dry ton/day biosolids drying/pelletization plant, with added responsibility for marketing/distribution of 50,000 dry tons/year of (pellet) fertilizer product. The contract, which began in 2001, is a 30-year ownership agreement (Veolia has 67% stake in Special Purpose Corporation) with full-risk management and operations for facilities. The Metropolitan Biosolids Management facility was privately financed with tax-exempt Environmental Improvement Revenue Bonds (20-year note) via a 501(c)(3) municipal lease structure. The facility is currently processing an average of 135 dry tons per day of cake biosolids into nearly 52,000 tons per year of NutriPel product.
- **Baltimore City Composting Facility (BCCF), Baltimore, Maryland** - Veolia has provided biosolids management services since 1984 under a long-term partnership with the City of Baltimore and the Northeast Maryland Waste Disposal Authority (NMWDA). This award-winning facility was first financed, designed, built and started-up by a Veolia predecessor company, and the plant today remains in successful operation under the long-term O&M agreement between Veolia and the NMWDA, with added responsibility for compost marketing. This is a 45 dry-ton-per-day in-vessel biosolids composting facility that is designed to process biosolids from the City of Baltimore's Back River Wastewater Plant. The end product from the compost process is purchased by both public and private users. The facility was financed with a loan to Veolia from the proceeds of 20-year fixed-rate, tax-exempt bonds issued by NMWDA, the managing entity. The City of Baltimore guaranteed the delivery and payment for processing a maximum of 54,570 wet tons of biosolids a year, with a tipping fee that covered debt service, a cash return on equity and the O&M fees. Today this plant operates as a "Net Zero Waste" site, as everything that goes into the facility leaves as compost product.
- **City of Arvin, California** – Veolia worked with the City to develop an innovative project financing and implementation approach that provided for the fast-track upgrade and expansion of its existing wastewater facilities through a modified DBFO type of agreement. Our approach also involved working with the City to take advantage of a then new infrastructure private financing statute in California (Government Code Section 5956 et. seq.). Due to the flexibility afforded under that legislation, the City was spared a lengthy procurement and bidding process. By selecting Veolia, the City of Arvin obtained an experienced and expert operator for its wastewater treatment facilities in just eight weeks. To further assist the City, which was financially strapped, Veolia provided up-front savings of over \$1.7 million to help the City of Arvin retire its outstanding debt. This facility, Veolia's first design/build project, was completed on time and expanded the wastewater plant to a capacity of 2-MGD. Veolia has ongoing O&M responsibility for the expanded plant under a 35-year agreement that began in 2008.

This experience is illustrative of Veolia commitment to providing project financing as a tool to address certain challenges identified by municipal clients, and we stand ready to work with the City of Harrisburg under this new contract.

Veolia also has the corporate resources, administrative staff and operational personnel necessary to provide all of the required management, operations, financial and support services associated with transition/transfer of City's water and wastewater operations and then ensuring effective long-term O&M.

Veolia most recently demonstrated this type of experience in transitioning employees and operations that were part of the acquisition of municipal O&M contracts from American Water. This transaction, completed in 2018, involved the transition of more than 100 staff and multiple operations. This acquisition added more than 47-MGD of capacity to Veolia's overall operations. These operations included 22 projects and 13 municipal wastewater treatment plants, and these facilities are now operated by Veolia under ongoing O&M agreements and many include capital project responsibility.

### Meridiam - Financial and Development Partner

Meridiam has joined with Veolia in submitting this Letter of Interest as our financial and development partner. This firm's ultimate role in this project would be to structure the financing and lease of operations for the City's water and wastewater systems.

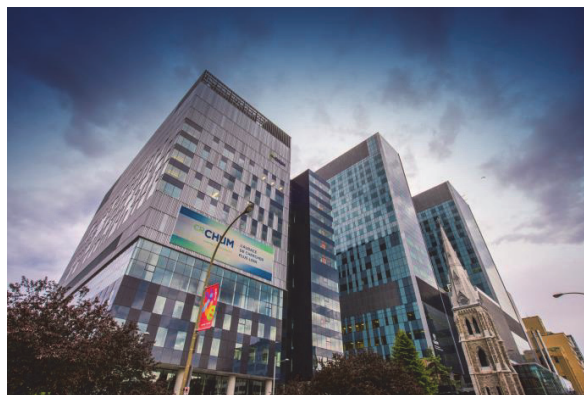
Founded in 2005, Meridiam is a global investor and asset manager specializing in development, financing and management of sustainable long-term public infrastructure projects. The firm's unique 25-year funds enable it to be a long-term partner to public sector clients on projects -- from project inception through operations and asset hand-back.

Meridiam is currently managing over \$6.8 billion of assets, and the firm has to date been named preferred bidder or reached financial close in more than 70 projects in 20 different countries worldwide for a total project financing exceeding \$50 billion. Investors in Meridiam include U.S.-based pension funds and insurance companies.

As an ISO 9001 certified company, Meridiam places environmental, social and governance issues at the core of its strategy. Including enabling access to clean water and sanitation, United Nations Sustainable Development Goals are part of Meridiam's DNA, with an emphasis on forming effective partnerships along these goals to deliver impact for communities.

Meridiam has been engaged in municipal project development, completed capital projects for municipal clients valued at \$25 million or more. These capital projects have been completed over the past 15 years, and have been implemented in compliance with applicable state and/or federal procurement laws. Key examples public works projects are profiled below:

- University of Montreal Hospital Research Center (CRCHUM), Montreal, Quebec** - CRCHUM brings together the largest concentration of biomedical researchers in Quebec. Meridiam acted as co-lead on development and debt raising, and also worked very closely with the financial advisor to analyze market conditions and project-specific attributes to select the best financing solution. Meridiam was heavily involved in structuring the financing solution, addressing key commercial issues, engaging the rating agencies, and negotiating the different financing agreements with the consortium's sole underwriter. The project was financed by: \$134.9 million in public sector contribution through three milestone payments; \$60.1 million of short-term bonds to bridge the fourth and final milestone payment; \$334.1 million of long-term amortizing bonds to be repaid by availability payments during the operating period; \$13.9 million of interest income; and \$43.8 million of equity funds. Through the Project Company, created to be the single point of contact with the client, Meridiam is currently involved in the oversight and day-to-day asset management throughout the maintenance phase. The maintenance risk and responsibilities are being undertaken by the facilities management services company under a back-to-back principle with the concession agreement.
  - Additionally, under a separate transaction, Veolia (through our energy services arm) is a shareholder and service



As one of two major hospital networks in the City of Montréal, Centre Hospitalier de l'Université de Montréal (CHUM) is associated with the Université de Montréal, a prominent teaching hospital, includes three sites covering two city blocks. CHUM and its Research Centre (CRCHUM) rank among the largest P3 projects in North America. Veolia is a shareholder and service provider for CHUM, and Meridiam is engaged with the CRCHUM facility as part of the development team manager for the maintenance of this facility. This demonstrates common P3 experience for the Team that we have proposed to work with the City of Harrisburg.



provider for the Montréal, Centre Hospitalier de l'Université de Montréal (CHUM) hospital project which is designed to serve 345,000 ambulatory patients, 22,000 inpatients and 65,000 emergency patients each year. As one of two major hospital networks in Montréal CHUM is associated with the Université de Montréal — a prominent teaching hospital comprising three sites covering two city blocks. The CHUM Collectif Consortium, of which Veolia is a 20% partner (20% equity provider and 100% O&M services provider), was responsible for developing this new 3.5-million-square-foot hospital complex and energy plant. The facilities are nearing completion (slated to be complete in 2020), with the first phase, where 85% of the hospital is fully operational, is now in the commissioning and acceptance phase.

Veolia, as the O&M provider, has responsibility for maintenance, life-cycle and energy performance management and security services for the new facilities with an operations team of 75 maintenance staff and 90 security staff. The overall P3 project is being implemented by a consortium team that includes: Veolia as the equity provider and O&M services provider; Laing'O'Rourke and OHL as an equity providers and builders (construction managers and contractors); and Innisfree and Equity partners. This Public-Private Partnership (P3) project is the largest hospital in North America, with a total project cost of \$1.988 billion (Canadian). Veolia's contract, including O&M services has a value of \$1.285 billion (Canadian) over the 34 years of service, with an annual average O&M fee of \$38 million. This Public-Private Partnership (P3) was funded as follows: bond financed - 88.4 %, and sub-debt + equity - 11.6%.

- **VNF Dams Project, France** – This project has challenges very similar to those that will be part of this proposed new transaction with the City of Harrisburg, in the sense that it is a system of multiple infrastructure assets. The portions of the project that achieved financial close in 2013 involved replacing 29 human-operated navigation dams by modern water-inflatable dams, along with the construction of four micro-hydro power plants and fish passages for each dam. The \$348 million project required a capital expenditure plan that covered the 29 dams and which was spread over 6.5 years. Meridiam demonstrated the ability to secure a cost-efficient 90:10 debt-to-equity ratio financial structure tailored to the project schedule for the overall system upgrade, which included sub-tranches of capital expenditures commissioned at different times.
- **Gipuzkoa Waste-to-Energy Plant, Spain** - Another specific Public-Private Partnership (P3) project experience of Meridiam that is highly relevant to the is the Gipuzkoa Plant. This 35-year contract closed in 2017, and allows the Meridiam-led concessionaire to have the exclusive right to receive municipal waste and treat it to produce electricity through incineration. The project utilizes a mixture of revenue streams, including availability payments, variable payments based on mass of waste treated, and sales of electricity generated by the plant. As such, project is a hybrid between an availability payment and revenue risk project. This \$270 million project was financed with diverse sources, corresponding to a debt-to-equity ratio of 80:20. This project highlights Meridiam's expertise in forming cost-effective contractual structures, as the price offered by the Meridiam-led consortium was 25% lower than the tender price set out in the specifications document for the waste treatment plant. Additionally, this project demonstrates Meridiam's dedication towards building sustainable and resilient infrastructure that contribute to a circular economy and improve the quality of people's lives. The consortium's proposal included energy-efficiency levels that were 30% higher than required in the tender specifications and by European legislation at the time of project close.

Meridiam global experience includes portfolio of 70 infrastructure projects, with 15 infrastructure projects in North America, eight of which are already operational.

Meridiam will leverage this experience in creating a robust financial structure for this proposed transaction with the City of Harrisburg, which will be optimized according to the upfront payment, effective rates under the regulation, detailed capital infrastructure improvement plans and the contractual structure.

# INTRODUCTION

## **Part 2: References**

## Introduction – Part 2: References

### Introduction

**Veolia Water North America Operating Services, LLC** (Veolia) is the Respondent to the Request for Letter of Interest (RFQ) issued by the **City of Harrisburg, Pennsylvania**, for this proposed new partnership for developing and delivering a long-term agreement for the acquisition of your water and wastewater system (System) under the proposed Acquisition agreement.

As the leader in providing comprehensive operations, maintenance and management (O&M) and ownership approaches for utilities in the U.S. and throughout the world, Veolia has the proven base of experience and expertise needed to be an effective partner to the City of Harrisburg.

In North America, Veolia has ongoing O&M partnerships with some 209 municipal clients, with responsibility for 210 municipal wastewater plants that treat more than 1.7 billion gallons of flow each day to meet the needs of over 5.4 million people, along with 89 municipal water treatment plants that supply potable water to more than 4.7 million people.

Veolia in North America is also part of a global services provider, Veolia Environnement, S.A., which has a more than 166-year history working with governmental and commercial clients, and today provides over 95 million people with drinking water and over 63 million people with wastewater service.

The Reference Projects that are profiled in this section have been selected to represent the key experience that Veolia offers on comparable water and wastewater projects that are in many ways similar to the City of Harrisburg's operations.

This includes a number of water and wastewater systems that Veolia operates and manages under O&M agreements, some of which have involved concession agreements and payments, as well as contracts where we work with private owners who hold long-term (up to 30 year) agreements.

These projects also represent experience with the other key criteria that the City identified in your request for Letter of Interest in areas including:

- Experience in working with municipal clients to address Combined Sewer Overflow (CSO) planning and management (Nine Minimum Controls Plan).
- Experience in working with municipal clients on the development of MS4 Applications related to stormwater management.

In summary, the reference projects that are profiled in this Attachment demonstrate experience that is relevant to this proposed new concession agreement with the City of Harrisburg, and provide all of the information requested in the City of Harrisburg's request for Letter of Interest.

These Reference Projects are also representative of the overall base of experience that Veolia will bring to this proposed new partnership with the City of Harrisburg, and the City is welcome to contact these clients to confirm Veolia's record of performance under these long-term agreements.



For almost a decade Veolia managed an innovative water operations partnership with the **City of Indianapolis, IN**; delivering a transition approach that changed the management and operation of the City's water department. Veolia's management team achieved significant cost savings, organizational and operational improvements, technological advancements and management efficiencies. The Indianapolis water system is comprised of four surface water treatment plants (16-MGD to 96-MGD), five groundwater treatment plants (2-MGD to 24-MGD), a 4,300-mile distribution system, 29 water pump stations and multiple surface reservoirs and storage tanks. The Indianapolis water supply system also has multiple water pressure zones, with 15 districts and five sub-districts.

Veolia also initiated a new standard for water utility operations and service excellence at Indianapolis, completing the rigorous program for ISO 9001 and 14001 standards. This made Indianapolis the only major city in the U.S. that had achieved these standards for its water operations, and Veolia Water Indianapolis the first U.S. water company to be simultaneously certified in both.

Client Reference:

Mr. David Gadis, former President of Indianapolis Water and current CEO & President of DC Water, Washington, DC –  
Telephone: 202/787-2000 – Email: david.gadis@dcwater.com



## Reference Projects

### City of New London, Connecticut

Company/Agency name:	City of New London - Water and wastewater treatment facility operations.
Contact Person:	Mr. Barry Weiner - Chairman - Water and Water Pollution Control Authority 120 Broad Street, 2nd Floor, New London, CT 06320 - <u>Telephone</u> : 860/443-7092 – Email: Not Available (client does not provide a public email address)
Scope of Services:	<ul style="list-style-type: none"> <li>• Veolia is responsible for the day-to-day and long-term operation of the City's water and wastewater facilities</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• <u>Wastewater</u>:               <ul style="list-style-type: none"> <li>• 10-MGD Activated Sludge wastewater plant</li> <li>• Collection system (122 miles)</li> <li>• 8 pump stations.</li> </ul> </li> <li>• <u>Water</u>:               <ul style="list-style-type: none"> <li>• 9-MGD surface water treatment plant</li> <li>• Water distribution system (233 miles)</li> <li>• Six water reservoirs (25,000 acres)</li> <li>• Five water pump stations</li> <li>• Water storage tanks</li> </ul> </li> <li>• <u>Other Operations/Services</u>: Underground Asset Management (UGAM); fats/oils/grease (FOG) waste management program implementation and administration; customer service program management (water meter reading, billing/collection and customer service operations for 14,500 accounts); and MS4 Stormwater Management program.</li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• Initial O&amp;M contract in 2008 with a 10-year term.</li> <li>• City awarded Veolia an extension through 2028, and a second extension was signed in 2016 extending the term until 2033.</li> </ul>

Under this O&M partnership, Veolia is responsible for the day-to-day and long-term operation of the City's water and wastewater facilities. This contract also involved providing customer service for water operations, which include call center operations, meter reading and billing and collections. These operations serve 47,140 clients in the City of New London and three neighboring communities – covering 14,000 water connections.

The New London wastewater treatment facility provides secondary treatment with biological nutrient removal (BNR). Secondary treatment is provided by a Modified Ludzack-Ettinger (MLE) process, consisting of two parallel trains of an anoxic zone and aeration zone, with internal recycle capable of four times forward flow in each train. Three secondary clarifiers are followed by disinfection with sodium hypochlorite before release to the Thames River.

At the start of the initial O&M contract, Veolia was required to bid on capital work with the City for the water and wastewater facilities. Veolia quickly demonstrated that we could perform this capital work more reliably and for less cost than that of other contractors. Under the most recent renewal and expansion contract, the City assigns the work to Veolia under a no bid process. Having Veolia perform the work eliminates costs for the City and reduces their risk for the end result.

Another key element of Veolia's approach for the City of New London involves asset management planning and reliability centered maintenance (RCM) approaches, which are used to extend asset life expectancy while also reducing life-cycle costs. To facilitate this approach, Veolia created an integrated above-ground (AGAM) and underground asset management (UGAM) program to meet capacity, management, operation and maintenance program requirements for the City's wastewater collection system and to provide New London with the greatest knowledge and control of their infrastructure.

Veolia's integrated information technology program combines maintenance, operations and other information into a single repository, which records the entire life history of assets tracked. Our approach to information management is designed to integrate technology solutions, and link together the computerized maintenance management system

(CMMS), GIS and underground asset software, providing a fully-integrated IT system. Data that would otherwise be lost is recorded and available for managing staff, tracking, asset management and capital planning. The IT integration will improve the utilization of information databases to bring better decisions to the operation and management of the utility system. Veolia uses the information to develop efficient capital plans, provide better customer service and deliver a higher level of service.

The New London Contract utilizes two unique tools for above-ground and below-ground assets, including: Oracle Utilities Work and Asset Management (OWAM) CMMS tool in order to effectively manage the preventative and corrective maintenance activities associated for above-ground asset management. All equipment is identified in the program with preventative maintenance tasks and frequencies included. On a predetermined schedule, work orders are generated to the maintenance department where the work is performed and closed out in the database for archive. Corrective work orders are generated and closed out for all non-scheduled tasks. The underground assets are managed using the InfoNet™ (a multiuser software platform for managing water supply and sewerage asset data) database tool. This is a spatial database program that utilizes the City's existing GIS layer. Veolia's Collections and Distribution Manager at New London uses this program to schedule all preventive maintenance activities including: sewer jet cleaning; CCTV inspection; manhole inspections; valve exercising; and hydrant flushing. Corrective work-orders are generated to document un-scheduled activities. All UGAM tasks are reviewed "real-time" and (as necessary) capital estimates and condition reports are forwarded to the City for review and approval. Typically if a sewer defect (collapsed sewer section) is identified, a report and repair proposal is provided immediately, upon authorization, a repair is performed by Veolia using in-house (or subcontracted resources), with all of the repairs work managed by Veolia.



**"With Veolia Water as our new partner, New London is ensuring reliable asset management and the protection of our valuable water and wastewater assets on a long-term basis with the lowest life-cycle management costs."**

— Kevin J. Cavanagh, Former Mayor

In 2010, the City contracted with Veolia to replace their obsolete analog SCADA systems at the water and wastewater treatment facilities. An Allen Bradley based system was selected and Programmable Logic Controllers (PLCs) were installed and programed to allow for managing the local operations integrating all existing field instrumentation and adding additional devices where necessary. All variable Frequency Drives (VFDs) were integrated and an overall supervisory control system was developed. Additionally, PLC control panels were installed at all remote pumping stations, with radio telemetry utilized to return monitoring and control signals to the supervisory system. All critical alarming is forwarded to the Operators Cellular Phone that is carried by the On-Call Operator from Veolia for immediate response.

All compliance related data is managed utilizing the Hach Water Information Management Solution (Hach WIMS) data management software. Veolia's Water and Wastewater Operations Managers manage the input of operating and laboratory data into the Hach WIMS program, where pre-programed process control and regulatory compliance reports are generated; data alarms are set beneath pre-determined limits which trigger evaluation and comment by the Operations Manager. These reports are reviewed by Veolia's Project Manager and our regional Technical Manager prior to submission. Veolia also produced monthly reports on key process parameters that are evaluated against predetermined upper and lower control limits.

This contract also involves providing customer service for water operations, which include call center operations, meter reading and billing and collections (14,100 customers). Veolia's New London team has achieved significant improvements in customer service since the start of the contract, developing management approaches that Veolia has applied locally for the benefit of other projects, such as that with Town of Seymour, Connecticut (a wastewater utility where Veolia manages billing and customer service for more than 4,000 accounts).

The scope encompasses: service turn on/off; billing/collections complaints; handling all money; handling delinquent accounts and referring old accounts to the Town attorney; and operations issues for users billed on a semi-annual basis.

Veolia has a full time O&M staff of 39 that are responsible for the operations at New London, and they are part of the regional resource base that our firm can call upon to support the routine and emergency needs for our water and wastewater operations in the Northeast region.

## City of Leominster, Massachusetts

Company/Agency name:	City of Leominster – Wastewater treatment plant and multiple water treatment plants.
Contact Person:	Mr. Roger Brooks, Business Manager, Water & Sewer Department City of Leominster - 25 West Street (City Hall), Leominster, MA 01453 <u>Telephone</u> : 978/534-7590, Ext. 504 - <u>Email</u> : rbrooks@dpw.leominster-ma.gov
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M of a Wastewater Treatment Plant and multiple Water Treatment Plants.</li> <li>• Veolia has repair and replacement responsibility under this contract to predetermined limits.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• <u>Wastewater Facilities/Operations</u>: <ul style="list-style-type: none"> <li>• 9.3-MGD Advanced Secondary Activated Sludge Wastewater Treatment Plant</li> <li>• 10 Sewage Pump Stations</li> <li>• Industrial Pretreatment Program (IPP) Management</li> <li>• Wastewater sludge hauling and disposal to an approved out-of-town disposal facility - 1,396 dry tons per year</li> <li>• Septage Receiving and Disposal</li> </ul> </li> <li>• <u>Water Facilities</u>: <ul style="list-style-type: none"> <li>• Three Surface Water Treatment Plants (4-MGD, 2-MGD and 1.2-MGD)</li> <li>• Wellfield (1.6 MGD)</li> <li>• Raw Water Pump Station</li> <li>• 5 Water Booster Pump Stations</li> <li>• Chlorination Station</li> <li>• 3 Clear Wells</li> <li>• 3 Storage Tanks</li> </ul> </li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• Wastewater O&amp;M contract that began in 1983, and was renewed in 2017 for a new 10-year term</li> <li>• Contract was expanded in 1996 to include the water treatment plant operations.</li> </ul>

This O&M partnership began in 1983, and today ranks as our Veolia's longest-running municipal O&M contract in the state of Massachusetts. Like the proposed agreement with the City of Harrisburg, this contract covers the operations of the City's water and wastewater facilities under a common agreement.

At the initial startup of this O&M agreement, Veolia assisted the City by renovating their existing wastewater facility, which at that time was one of the oldest activated sludge plants in the area. Additionally, biosolids experts from our company assisted the City with evaluating alternative disposal options.

In our work at the City of Leominster, Veolia has completed the planning and delivery of capital projects, ranging from facility repairs and improvements up to the delivery of a new water plant using the DBO project delivery approach.

This work, which was managed and implemented by Veolia's in-house Capital Program Management team in the Northeast region, and that work included:

- Wastewater Treatment – At the City's 9.3-MGD Water Pollution Control Plant this work has included the addition of a new Veolia ACTIFLO™ phosphorus removal system, nutrient removal, primary electrical service, standby generator and automatic transfer controls, as well as a plant-wide SCADA system – all completed in 2013 at a cost of \$20 million. These capital improvements brought the wastewater plant into compliance with an Administrative Consent Order from the U.S. Environmental Protection Agency (U.S. EPA).





- **Water Treatment** - The capital program work for the City's water facilities covered the design and construction of the 2-MGD Distributing Reservoir Water Treatment Plant, which was built to satisfy an Administrative Consent Order from the U.S. EPA. This plant came on-line in 2010, and was delivered under a DBO approach, an approach that delivered this new plant at a cost \$3 million under the City's original estimate. At the water plants, raw water is supplied by three reservoir systems and a wellfield. Filtration of raw surface water is conducted at three of the terminal reservoirs, while the third reservoir operates under a state of Massachusetts issued filtration waiver. The water system improvements also included: the addition of adsorption clarification with GAC filtration at the Distributing Reservoir; the addition of clarification, chemical feed system upgrades and residuals handling facilities at the Notown Water Treatment plant; along with pump replacement, electrical upgrades, corrosion control, permanent disinfection equipment at the Southeast wellfield.

In total, Veolia has completed more than \$50 million in capital project work for the City's water and wastewater facilities in recent years – saving the City over 30% in projected capital project costs for the new Distributing Reservoir water treatment plant.

Our scope of work under this contract includes managing the City's revenue-generating septage operation. This includes controlling, monitoring and checking all septage trucks that utilize the City's wastewater treatment facility for the receiving and treatment of up to 6,000 gpd of septage. This is one of more than 10 such operations that Veolia has in the Northeast region, and our work scope covers monitoring the quality of incoming septage, ensuring that the septage receiving area is kept neat and providing septage billing information to the City.

Over the course of this contract, Veolia has served the City and citizens of Leominster well, providing quality services that have earned many expansions and renewals of this partnership. Veolia's performance under this contract has also been recognized with awards including the National Council for Public-Private Partnerships Service Award. This award, presented to Leominster's water and wastewater staff in 2010, recognized 25 years in which the partnership had improved the City's water and wastewater infrastructure while consistently maintaining low costs. Other awards that have been presented to the project in recent years have included: Utility of the Year Award from the New England Water Works Association in 2011; George W. Burke Jr. Safety Award from the Water Environment Association, Region I in 2011 and 1998; and an O&M Excellence Awards from Massachusetts Water & Pollution Control Association in 1988 (Honorable Mention) and in 1987. Most recently, in 2018, the Leominster wastewater treatment plant was recognized with the U.S. EPA's Regional Wastewater Treatment Plant Excellence Award, marking the third time that this plant has been recognized with this award, which is given to treatment plants that demonstrate outstanding technical achievements or innovative processes in their waste treatment and pollution abatement programs.



## City of Rialto, California

Company/Agency name:	City of Rialto, California – Initial contract with City as an O&M provider. Rialto Water Services, LLC – Current contract with private owner as and O&M provider.
Contact Person:	Mr. Rolf Ohlemutz, General Manager Rialto Water Services, LLC - 437 N. Riverside Avenue, Rialto, CA 92376 <u>Telephone</u> : 916/917-0437 – <u>Email</u> : rolf@t-rockcap.com
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M of Water and Wastewater facilities, as well as customer service operations, for the private owner, Rialto Water Services, which provides services to over 100,000 people in the Inland Empire area of California.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• <b>Wastewater Facilities/Operations:</b> <ul style="list-style-type: none"> <li>• 11.7-MGD Activated Sludge wastewater treatment plant</li> <li>• Sewer Collection System: 286 miles of sewer line and six lift stations</li> <li>• Industrial Pretreatment and FOG Receiving and processing program management</li> <li>• Gas Treatment System and Fuel Cells operations for energy recovery</li> <li>• Capital Improvement and Underground Asset Management programs</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Biosolids Land Application and Recycle Water Supply (Title 22) program management</li> <li>• <u>Water Facilities:</u> <ul style="list-style-type: none"> <li>• Water Supply: 5 water wells (11 MGD capacity)</li> <li>• Water Distribution and Storage System: six finished water storage reservoirs (28 million gallons capacity), 162 miles of distribution line, 11 water booster pump stations and 2,000 Fire Hydrants</li> <li>• Customer Service Operations: water meter reading and billing for water and sewer systems</li> </ul> </li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• O&amp;M Agreement with City: 2003-2012 (completed and transitioned to contract with new owner)</li> <li>• O&amp;M Agreement with Private Owner: 2012-2042 (ongoing).</li> </ul>

Veolia worked with the City for eight years as their O&M provider, and that contract was transitioned to a new agreement with Rialto Water Services, the concessionaire of the City's water and wastewater systems.

At the start of the contract, Veolia conducted an initial condition assessment of the utility assets to determine the baseline condition of the assets and to identify areas requiring immediate attention to ensure reliable service and begin lowering life-cycle operation costs. Following the completion of the initial system evaluation, we prepared a list of 50 critical needs for the operations. Veolia's O&M and capital program team then developed a five-year prioritized implementation plan for the City, assisting them with the development of their long term Master Plan.

The initial \$7 million capital improvements program developed by Veolia (covering \$4 million for the wastewater system and \$3 million for the water system) created operational savings for the City of more than \$2.5 million under the initial O&M contract (2003-2012).

Veolia also implemented Reliability Centered Maintenance (RCM) program, registering all the underground and aboveground assets into the asset management program. This RCM program approach reduced energy costs by \$135,000 in the first year of the O&M contract, with a projected 30% reduction in capital replacement costs through increased life expectancy of equipment.

Rialto Water Services, LLC (RWS), the concessionaire of the City's water and wastewater systems, was established under a privatization agreement in 2012 to address the City's interest in completing critical water and wastewater system capital improvement projects and implement efficiency improvements, without adding financial risk to the City. Under the RWS concession contract, the City retains ownership of the water and wastewater systems, water rights, and the rate-setting authority. RWS provides financial backing, oversight and concession services, and Veolia, as a direct contractor to RWS, delivers all water and wastewater O&M services, and oversees a \$41 million capital improvement program.

The City of Rialto's water utility system receives 70% of its potable water from groundwater wells with chlorine treatment at the well heads, and the remaining 30% of the water is from other sources. Veolia routinely performs raw and finished water sampling in accordance with state regulations to identify issues with either of the water sources and solve any problems.

## City of Boonville, Indiana

Company/Agency name:	City of Boonville, Indiana - Contract O&M agreement for water and wastewater facilities.
Contact Person:	Honorable Charles Wyatt, Mayor City of Boonville, 135 South Second Street, Boonville, Indiana 47601 <u>Telephone:</u> (812) 897-1230 - <u>Email:</u> boonvillemayor@gmail.com
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M of Water and Wastewater facilities, with additional responsibility for management of Public Works and Fleet Maintenance.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• <u>Wastewater Facilities/Operations:</u> <ul style="list-style-type: none"> <li>• 2.9-MGD Activated Sudge WWTP</li> <li>• 15 Lift Stations</li> <li>• Sewer Collection System (91 miles)/Collection System Rehabilitation</li> </ul> </li> </ul>

- Septage Receiving
- Biosolids Land Application -- 417 dtpy
- CSO Management
- Water Facilities:
  - 2.9-MGD Ground Water Treatment Plant
  - 4 Water Wells (2.9 MGD)
  - Water Distribution System (115 miles)
  - 3 Booster Pump Stations
  - 3 Elevated Water Storage Tanks (1.5 MG)
  - 2 Clearwells (2.3 MG)
  - Water Meter Reading/Replacement

History of Operations: • 1995, with multiple renewals, and ongoing through 2022

Veolia began working with the City under a long-term O&M agreement in 1995, and over the years Veolia has worked with the community to improve and expand their water and wastewater operations as this contract has been consistently renewed.

This contract now covers:

- Wastewater Operations: a 2.9-MGD activated sludge wastewater plant, 15 lift stations and 91 miles of sewer line) along with collection system rehabilitation, septage receiving and processing, CSO management and a sludge land application program processing 417 dry tons per year).
- Water Operations: a 2.9-MGD groundwater treatment plant, four water wells with a combined 2.9 MGD of capacity, 115 miles of water line, three booster pump stations, three elevated water storage tanks with a combined 1.5 million gallons of capacity, along with two clearwells (combined capacity of 2.3 million gallons).
- Customer Service: Meter reading and replacement. The City of Boonville has ~3,700 water connections serving a population of ~10,500 and ~2,800 sewer connections.
- Other Services: Public works and fleet maintenance management.

**Veolia implemented various improvements that helped the City of Boonville's operations to achieve 100% environmental compliance, which allowed the U.S. EPA and the State of Indiana's Department of Environmental Management to lift the Consent Decree Order and issue the City 700 sewer taps supporting growth in the Boonville area.**



The initial driver for the City of Boonville in reaching out to Veolia was a Consent Decree placed on their wastewater treatment plant, which prevented any growth in the community. The City's facilities were in poor condition and required significant improvements in order to maintain compliance. Additionally, because of the failing infrastructure, the City was required to purchase more than 18 million gallons of treated water per year from a neighboring community at an annual cost of nearly \$150,000.

Veolia quickly mobilized to address the City's core issues, conducting a hydraulic analysis of the wellfield and associated infrastructure to determine if additional capacity was available. An aggressive maintenance schedule was then implemented to increase capacity by flushing and removing the iron built up inside the 14-inch raw water transmission main. We then worked to replace numerous failing water lines that resulted in high water loss levels. The completion of the initial work tasks also resulted in an annual electrical savings of nearly \$50,000 through more efficient operations and reduced run times for equipment.

In total, Veolia has saved the City over \$2 million in life-cycle operations costs by enhancing process control efficiencies and by increasing in-house laboratory testing. We also designed and installed a new CMMS that includes SCADA communication systems to improve the overall performance of the facilities, and asset management software to assist with preventive and predictive maintenance programs that increased system reliability and resilience and increased the lifespan of system assets.

Some of the other key benefits that Veolia has provided the City under the ongoing contract include:

- Worked with the City's engineers to support construction of the \$9 million wastewater plant expansion and construction of the new \$4.5 million 2.9 MGD water treatment facility (placed online in 2010). This included startup and testing, along with the transition of the facilities and operations to our O&M team.
- Provided design and specification input and planning expertise for \$4 million in water distribution system upgrades and \$6.5 million in CSO improvements.
- Worked with the City for planning a \$1 million conversion of 3,700 water meters to automated meter reading, and \$3 million in water distribution line extensions and replacements.

Based on Veolia's demonstrated successes, our contract with the City has been consistently renewed and expanded over the past more than 20 years.

## City of Richmond, California

Company/Agency name:	City of Richmond, California - Separate O&M contracts for the City's wastewater treatment plant and collection system and stormwater management operations.
Contact Person:	Mr. Ryan Smith, Director of Water Resource Recovery City of Richmond - 450 Civic Center Plaza, Richmond, CA 94804 <u>Telephone</u> : 510/620-5486 - <u>Email</u> : ryan.smith@ci.richmond.ca.us
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M and capital improvements for the City's wastewater treatment plant.</li> <li>• Comprehensive underground asset management (UGAM) program for the City's sewer and stormwater operations.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• <u>Water Treatment Plant Operations</u>: <ul style="list-style-type: none"> <li>• 16-MGD Activated Sludge wastewater treatment plant</li> <li>• Capital improvements</li> </ul> </li> <li>• <u>Collection and Stormwater Systems Operations</u>: <ul style="list-style-type: none"> <li>• Collection System (295 miles - sanitary/stormwater)</li> <li>• 21 Lift Stations</li> <li>• CSO Management</li> <li>• MS4 Stormwater Program Management</li> <li>• Underground Asset Management under which Veolia is responsible for the ongoing inspection, cleaning and repair of a sewer system that includes: 187 miles of gravity sewer Line (4 to 66 inches in diameter) and 15 miles of pressure pipelines</li> </ul> </li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• Wastewater Treatment Plant O&amp;M: 2001 – Ongoing</li> <li>• Collection System O&amp;M: 2004 – Ongoing</li> </ul>

Under separate contracts, Veolia has full responsibility for the O&M of the City's 16-MGD wastewater treatment plant and their collection and stormwater management system.

The City first entered into this long-term public-private partnership with Veolia in 2001 to curb excursions at its wastewater treatment plant, address long-time odor problems and rein in the ever-increasing costs to operate and maintain the aging and neglected facility. The work scope began with a DBO contract to implement more than \$7 million in capital upgrades for the wastewater plant, which Veolia also operated. This work resulted in improvements in regulatory compliance and successful odor control at this secondary activated sludge wastewater treatment plant. The processes at that wastewater treatment plant include mechanical bar screens, dissolved air flotation, anaerobic digestion, chlorination and dechlorination of final effluent and dewatering and disposal of sludge.

Under this second contract that began in 2004, Veolia has responsibility for a \$17 million capital program and operations responsibility for a system that includes 280 miles of collection and stormwater system lines, 20 lift stations, 5,200 manholes and 3,300 catch basins. The scope also includes management of the City's combined sewer overflow (CSO) program. Veolia's CPM group in the West was responsible for oversight and management of design/build implementation of capital improvements for this project. The work at the wastewater plant focused on updating, modernizing and automating the existing processes and systems at the facility.



In the initial two years of the contract, Veolia achieved the primary goals of increasing the efficiency and effectiveness of plant operations and, in turn, curtailing discharge violations and controlling odors. The work was completed ahead of schedule and focused on rehabilitating deteriorated systems and resolving long-standing odor problems. The design work involved providing preliminary and final design documents for improvements to the headworks, anaerobic sludge digesters (Nos. 1 and 2), and primary clarifiers at the wastewater plant. Veolia also upgraded the plant SCADA, added equipment redundancy and added a concrete chemical containment facility to enhance worker safety and protect the environment.

Based on the success of the wastewater plant upgrade program, the City added collection system improvements and O&M to our scope after just two years under the first O&M contract. Under this second contract, Veolia implemented a comprehensive underground asset management (UGAM) approach for the City's collection and stormwater systems. That program incorporated GIS and a condition assessment and ranked asset criticality.

We also employed the U.S. EPA's CMOM best practices that integrate an SSES approach, hydraulic modeling and flow studies to establish a hierarchy and timeline for improvements. Our UGAM program at Richmond has brought the City's underground assets into compliance with State of California requirements for a sewer system management plan and sanitary sewer overflow controls.

### City of Wilmington, Delaware

Company/Agency name:	City of Wilmington, Delaware - Contract O&M agreement for wastewater facilities and capital program management.
Contact Person:	Ms. Kelly Williams, Commissioner of Public Works - City of Wilmington Louis L. Redding City/County Building. 800 French Street, Wilmington, DE 19801 <u>Telephone</u> : (302) 576-2567 - <u>Email</u> : kwilliams@WilmingtonDE.gov
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M of Water and Wastewater facilities, with additional responsibility for management of Public Works and Fleet Maintenance.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• 134-MGD Envirex High-Rate Activated Sludge WWTP</li> <li>• 3 Pump Stations</li> <li>• Industrial Pretreatment Program Sampling</li> <li>• Industrial Leachate</li> <li>• Land Application - Class A Biosolids—11,000 dtpy</li> <li>• Advanced Asset Management</li> <li>• Capital Improvements Program</li> <li>• CSO Real-Time Control Management</li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• <u>Start Date</u>: 1985 (renewed multiple times)</li> <li>• <u>End Date</u>: 2020 (ongoing and currently in renewal process)</li> </ul>

In 1985, Veolia operated just the solids processing process portion of the Wilmington wastewater plant. That contract was expanded and extended in 1998 as Veolia was awarded a new 20-year contract to provide full-scope O&M, managing the entire wastewater treatment process. As a part of this contract, our firm funded a \$15 million design/build/operate (DBO) effort for capital improvements – completing more than \$10 million of work some 10 months early.

Veolia served as the design-builder for these capital improvements, which included the upgrade of dewatering facilities with two high-solids centrifuges, the installation of a plant-wide SCADA system and fine bubble diffused aeration to enhance system operation and conserve energy. These operations then became a part of our O&M scope.

In 2011, Veolia collaborated with the City and the city-wide Energy Services Company to develop, deliver, commission and provide initial operations for the Renewable Energy Biosolids Facility (REBF) installed at the wastewater plant.

Under this approach, Veolia participated in each phase of the design-build project, with lead roles in the thermal drying processing technology concept using recovered heat from the co-generation system as renewable thermal energy in the form of hot oil for producing EQ/Class A biosolids product

Veolia's O&M responsibilities at the wastewater plant include biosolids master planning and systems energy efficiency initiatives. In 2011, Veolia collaborated with the City and its city-wide Energy Services Company to develop, deliver, commission and operate the new REBF facility. This innovative green energy project is designed to use flared digester gas, supplemented with adjacent landfill gas, to fuel two reciprocating cogeneration engines to yield four megawatts of sustainable power for use at the plant. The REBF promotes environmental sustainability via recovery of heat from the engines to transfer into thermal oil for a new 30-dtpd indirect-heat dryer to produce Class A dried biosolids to market to customers.

Under the current contract, Veolia provides O&M for the City's 134-MGD conventional activated sludge facility, which ranks as the largest wastewater treatment plant in the State of Delaware.

The influent flow systems includes three force mains which enter the wastewater treatment facility at the Fine Screen Buildings, one force main that conveys flow from the City of Wilmington and two additional force mains that transmit flow from New Castle County. The operations also include three wastewater pump stations, with a combined flow of 222.05-MGD, which are used to convey flow from within the City limits to the plant.

Veolia has also worked closely with the City over the years to maximize the diversion of combined sewer overflow (CSOs) into the plant for effective treatment. This has included providing daily O&M of the City's combined sewer outfall real-time control (RTC) system. This system converts the passive underground piping into a dynamically controlled storage system through use of rain gauges, water level and flow sensors and regulators. Use of SCADA for continuous monitoring enables operators to mitigate potential CSOs by diverting flows to areas of the underground system that have the capacity to handle or store excess wastewater. Veolia also implemented several improvements to the CSO real-time control system to target further reducing overflows, and in just three years we have reduced CSO volumes from 1,210 million gallons to a low of 410 million gallons. Our goal under the current operations approach remains on accepting and treating as much storm flow as possible, thus minimizing CSO discharges.

Using this approach, Veolia's O&M team has substantially reduced sanitary sewer overflows into the Delaware River by carefully monitoring the CSO system – completing over 77,400 CSO inspections between 2010 and 2017.



The work of Veolia's O&M team at the City of Wilmington has been recognized with numerous awards, including the 2018 Gold Peak Performance Award from NACWA, and also a "Seal of the City of Wilmington" certificate of appreciation.

The Seal of the City award was presented by the City's Deputy Commissioner, Vince Carrocaia, and he expressed the City's gratitude for Veolia's contribution to capital improvements that support public health and the protection of the environment.

## City of Bastrop, Louisiana

Company/Agency name:	City of Bastrop, Louisiana - Contract O&M agreement for wastewater facilities and stormwater management.
Contact Person:	Honorable Henry Cotton, Mayor City of Bastrop, City Hall, 202 East Jefferson Avenue, Bastrop, Louisiana 71220 <u>Telephone</u> : 318/283-3301 - <u>Email</u> : mayorhenrycotton@cityofbastrop
Scope of Services:	<ul style="list-style-type: none"> <li>• O&amp;M of wastewater facilities, with additional responsibility for stormwater management.</li> </ul>
Facilities, Systems and Processes:	<ul style="list-style-type: none"> <li>• 1.8-MGD RBC Tertiary WWTP</li> <li>• 1.4-MGD Post-Aerated Lagoon WWTP</li> <li>• 0.51-MGD Pretreatment Equalization System</li> <li>• 0.1-MGD Industrial Pretreatment System</li> <li>• Sewer Collection System (200 miles)</li> <li>• Stormwater System (300 miles)</li> <li>• 3,000 Manholes</li> <li>• 24 Lift Stations</li> <li>• Industrial Pretreatment Program</li> <li>• Septage Receiving</li> </ul>

	<ul style="list-style-type: none"> <li>• Collection System Rehabilitation</li> <li>• MS4 Stormwater Management Program</li> <li>• Biosolids Disposal - 92 dtpy</li> </ul>
History of Operations:	<ul style="list-style-type: none"> <li>• 1996 – Contract has been renewed multiple times and is ongoing.</li> </ul>

During the final stages of a major facility upgrade and rehabilitation, the City of Bastrop, selected Veolia as its long-term partner to operate its complex new wastewater treatment system. Recurring noncompliance with several U.S. EPA Administrative Orders, years of failed toxicity tests and severe odor problems were among the issues facing Veolia as we assumed responsibility for Bastrop's wastewater treatment facility in 1996.

Our O&M team, supported by regional and corporate resources worked to address these needs, and the odor problems were resolved within the first few days of operation. Other work included replacing the West Pond influent pump station, with Veolia performing all of the work for this replacement project, saving the City 50% of the cost of contracting the job. We also replaced the chlorine system at the main treatment plant, saving the City \$200,000 over five years through reduced chemical consumption.

Under the current contract, Veolia operates the City's two wastewater plants, including the Main Plant, using the rotating biological contactor (RBC) technology prior to discharge to Staulkinghead Creek, and the West Pond facility, an accelerated facultative lagoon system designed for an average daily flow of 1.4 million gallons and a peak capacity of 2.7 million gallons; while facultative lagoons typically provide zones for both anaerobic and aerobic decomposition of wastewater, an accelerated process delivers large quantities of oxygen to speed aerobic decomposition and keep odors to a minimum. Treated flow proceeds to two manmade marshes where rows of bullrushes and duckweed help remove additional organics. Flow from the marshes enters an aerated polishing cell where ammonia is converted to nitrogen. Final effluent is discharged to Tisdale Brake Canal.

The North Pond facility is a conventional lagoon system that is used as a flow equalization system. It consists of one 35-acre and one 5-acre cell. All flow is pumped to the West Pond facility via a 13,000-foot force main for final treatment.

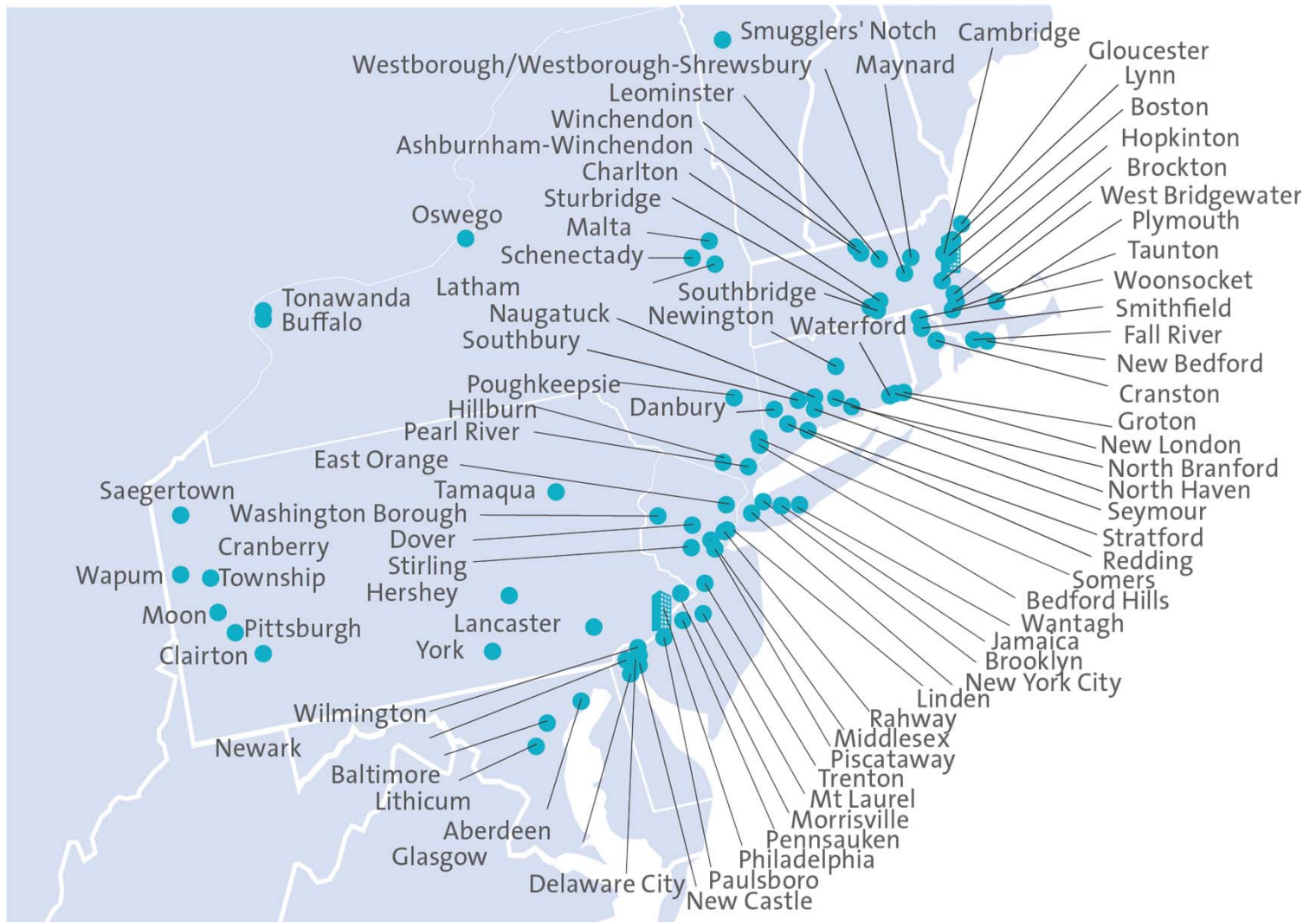
The industrial pretreatment lagoon is a three-cell aeration system that services a local chicken processing facility, reducing the strength to normal levels. The flow is discharged to the Main treatment plant. A new pump station was built to pump the industry's flow to the municipal facility.

In late 2009/early 2010, a major upgrade at the Main Plant included new pumps in the in-plant pump stations and variable speed drives. Variable speed drives were also installed on the blowers in the plant. They are controlled by dissolved oxygen sensors in the digesters. These improvements saved the City \$10,000 in electrical costs the first year. A belt press was also brought in during these improvements, which greatly enhanced the biosolids handling within the facility. These improvements were funded by a \$1.5 million ARRA (Stimulus) grant to the City of Bastrop, the result of a Veolia/City engineer joint effort to prepare and submit the application for the project.

In 2009, Veolia was tasked with developing and implementing a U.S. EPA-compliant MS4 program for the City's more than 300-mile stormwater system, which is composed entirely of open ditches and gravity drainage. Bastrop's MS4 program was implemented in conjunction with an Industrial Pretreatment Program and sewer line locates for Louisiana One Call. This program we designed implemented the required six Minimum Control Measures, including an aggressive public education and outreach effort, public participation and involvement, illicit discharge detection and elimination, construction site runoff control, post-construction runoff control and good housekeeping/pollution prevention. Stormwater sampling for Bastrop requires that samples be collected at random locations and at new construction sites 30 minutes following a half-inch rainfall. Battery-powered samplers can be deployed when needed and four rain gauges around the City connect to the wastewater plant SCADA system for rainfall monitoring.

In 2018 the City began a process for the design and construction of a new wastewater treatment plant which will replace the two aging wastewater facilities. The new plant will be built in four phases to be completed by 2021. The initial phase of the project consists of planning, design and construction of the facility, followed by the construction of a lift station that will bring wastewater from the pre-existing plants to the new facility, known as Plant No. 3. The third phase will construct an ancillary facility on the west side of the Colorado River to intercept wastewater lines. The final phase will be the shuttering of the city's pre-existing two plants. Wastewater Treatment Plant No. 3 will be a 4-MGD facility.

Veolia is expected to be engaged in these efforts, as the old plants are demobilized/decommissioned and the new plant is started-up and then put into operation.



## Attachment 1: List of Water and Wastewater Facilities

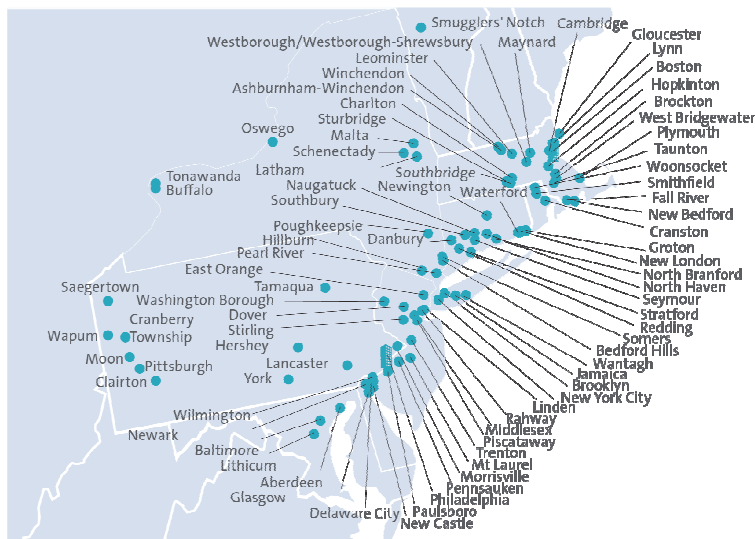


## Attachment 1: List of Facilities

### Part 1 – Projects and Operations in Pennsylvania and the Region

**Veolia Water North America Operating Services, LLC** (Veolia) has more than a century of project work experience in the State of Pennsylvania, providing engineering, construction and long-term operations, maintenance and management (O&M) services. The map, shown opposite, identifies the sites where our company currently has active business operations in the State of Pennsylvania and other parts of the Northeast and Mid-Atlantic region. These business operations include a range of commercial and other operations that are part of our business base, as well as water and wastewater operations.

Veolia's water and wastewater operations in the State of Pennsylvania are profiled on Table A.1-1, which follows, and they are part of the 210 municipal wastewater facilities and 89 municipal water treatment facilities that our company operates and manages in North America.



**Table A.1-1. Veolia Water & Wastewater Operations Projects in the State of Pennsylvania**

Project Name	Start Date	Facilities and Services
Elizabeth Township, Pennsylvania	2007	<ul style="list-style-type: none"> <li>1.4-MGD Activated Sludge Wastewater Treatment Plant</li> <li>Biosolids (sludge) Disposal</li> </ul>
Allegheny County Airport Authority, Pittsburgh International Airport, Pittsburgh, Pennsylvania	1985	<ul style="list-style-type: none"> <li>0.127-MGD Industrial Wastewater Pretreatment Plant</li> <li>0.012-MGD Landfill Leachate Groundwater Treatment Plant</li> <li>Remediation Facility</li> <li>Environmental Consulting</li> <li>Engineering Support</li> <li>Field Services</li> <li>Emergency Response</li> </ul>
Community College of Allegheny County, Pittsburgh, Pennsylvania	2016	<ul style="list-style-type: none"> <li>0.04-MGD Wastewater Treatment Plant</li> </ul>
Cambridge Area Joint Sewer Authority, Cambridge Springs, Pennsylvania	2000	<ul style="list-style-type: none"> <li>1.3-MGD Orbal Oxidation Ditch Wastewater Treatment Plant</li> <li>Sludge Disposal - 68 dry tons per year</li> </ul>
Midland Borough, Pennsylvania	2007	<ul style="list-style-type: none"> <li>1.25-MGD Trickling Filter Wastewater Treatment Plant</li> <li>Potable Water System</li> </ul>
New Sewickley Township, Pennsylvania	1996	<ul style="list-style-type: none"> <li>Water Pump Stations</li> <li>Wastewater/Sewer Pump Stations</li> </ul>
Pinney Dock, Pennsylvania	2012	<ul style="list-style-type: none"> <li>0.043-MGD Wastewater Treatment Plant</li> </ul>

**Table A.1-1. Veolia Water & Wastewater Operations Projects in the State of Pennsylvania**

Project Name	Start Date	Facilities and Services
Pittsburgh Convention Center, Pittsburgh, Pennsylvania	2014	<ul style="list-style-type: none"> <li>0.05-MGD Membrane Bio-reactor Wastewater Treatment Plant</li> <li>Chilled Water System</li> </ul>
Saegertown Borough, Pennsylvania	2012	<ul style="list-style-type: none"> <li>0.5-MGD Rotating Biological Contactor Wastewater Treatment Plant</li> <li>Water Treatment Plant</li> </ul>
Shippingport Borough, Pennsylvania	2006	<ul style="list-style-type: none"> <li>0.1-MGD Sequencing Batch Reactor Wastewater Treatment Plant</li> <li>Distribution System (4 miles)</li> </ul>
Wattsburg School District, Erie, Pennsylvania	2015	<ul style="list-style-type: none"> <li>0.04-MGD Wastewater Treatment Plant</li> </ul>

Veolia's municipal and commercial operations in the State of Pennsylvania are staff by state licensed water and wastewater professionals that form the core group of resources that our company would provide to support the transition and transfer of the City of Harrisburg's water and wastewater systems under this proposed new Concession agreement.

They are also part of the more than 2,000 staff that Veolia has in the region, as well as our company's more than 2,580 water and wastewater professionals in North America.

Veolia in North America is also part of a global company with over 170,000 employees worldwide engaged in providing water, waste and energy management solutions that contribute to the sustainable development of communities and industries. Through its three complementary business activities, Veolia's global operations help to develop access to resources, preserve available resources, and to replenish them.

In 2018, the Veolia group supplied more than 95 million people with drinking water and over 63 million people with wastewater service, and also produced nearly 56 million megawatt hours of energy and converted 49 million metric tons of waste into new materials and energy.

## Part 2 – Project & Operations with Water & Wastewater Operation for the Same Client

Veolia operates water and wastewater systems that range in scope from small plants to some of the largest systems in the U.S. This includes an almost 20-year partnership with **Tampa Bay Water**, an agency that supplies drinking water to more than 2.5 million people in central Florida. Veolia worked with that client to develop and deliver a now 120-MGD regional water plant using an innovative design/build/operate (DBO) model.

We also have a more than 10 year contract with the **City of Buffalo, New York**, for the management of their water system, which includes: a 160-MGD surface water treatment plant; two primary pump stations; six water storage facilities with a total capacity of approximately 40 million gallons; the water transmission and distribution system, which includes approximately 825 miles of pipeline, 22,000 valves and 7,700 fire hydrants; customer service management (meter reading, billing and collections); capital program management; and asset management programs for underground assets (UGAM) and above-ground assets. This system provides water service to some 73,000 accounts in and around the City.

In the area of wastewater, Veolia's long-term O&M partnerships include that with the **Milwaukee Metropolitan Sewerage District, Wisconsin**, for the management of their wastewater and stormwater system that serves the needs of some 28 communities in and around the City of Milwaukee for a user base of more than 1.1 million, and that with the **Downriver Utility Wastewater Authority (DUWA), Michigan**.



Tampa Bay Water, FL



Milwaukee Wastewater, WI

In 2018, Veolia was selected by DUWA as this new agency assumed the wastewater assets of Wayne County. The DUWA systems now ranks as the second largest wastewater system in the State of Michigan, serving a population base of more than 350,000 in a service area composed of 13 member communities.

DUWA worked with Wayne County on an asset transfer of the Downriver Sewage Disposal System (DSDS). As part of that process, DUWA initiated an RFP process for a contract O&M provider. Veolia responded to the RFP request, and was selected as the preferred provider. Veolia then completed a 90 day transition and is now operating the wastewater facilities under a 20-year OM&M agreement.

This new project involves providing O&M of wastewater facilities, as well as the development of capital planning recommendations. The wastewater treatment plant, located in the City of Wyandotte, is served by approximately 63 miles of interceptor pipe that is used to convey wastewater from 13 tributary communities and several Drainage Districts that operate wet weather storage facilities in the Service Area.

The 225-MGD plant, shown above, has the capacity to provide primary treatment for up to 150-MGD, and capacity to provide secondary treatment for up to 125-MGD. The wastewater plant treatment process consists of influent pumping, preliminary treatment, primary treatment, secondary treatment (high-purity oxygen activated sludge with secondary settling), and UV disinfection. Treated effluent is discharged to the Trenton Channel of the Detroit River. The system also includes a 15 million gallon wet weather storage tunnel that is used to retain excess wet weather flows during rain events.

In addition to this work in managing large and complex systems, Veolia has proven experience in managing combined water and wastewater systems for a single client. In fact, our firm currently has 26 North American operations where we operate both water and wastewater systems for the same client.

Table A1-2, which follows, provides a summary of locations where we have demonstrated that key area of experience for operations in the U.S. with O&M requirements similar to those at the City of Harrisburg. Many of these projects also include responsibility for the biosolids, stormwater and reclaimed water systems operations. At these sites Veolia provides cross-training for our O&M staff, covering both water and wastewater operations, which provides for staff redundancy to meet routine and emergency needs.



**Table A1-2. Veolia - Dual Water and Wastewater Operations in the U.S.**

Client/Location	Facilities/Operations
<b>Ashburnham &amp; Winchendon, Massachusetts</b> - Water contract ongoing since 2001 - Wastewater contract started in 2019	<ul style="list-style-type: none"> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 2-MGD Surface Water Treatment Plant</li> <li>▪ 2-MGD Raw Water Pump Station</li> <li>▪ Sludge (biosolids) Disposal</li> </ul> </li> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 1.1-MGD Activated Sludge Secondary Wastewater Treatment Facility</li> <li>▪ Biosolids (sludge) processing and disposal</li> </ul> </li> </ul>
<b>City of Boonville, Indiana</b> - Ongoing since 1995	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 2.9-MGD Activated Sludge wastewater treatment plant</li> <li>▪ 91 miles of sewer line and 15 lift stations</li> <li>▪ Biosolids land application program for 417 dry tons per year</li> <li>▪ Stormwater/Combined Sewer Overflow (CSO) Management</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 2.9-MGD groundwater treatment plant</li> <li>▪ 115 miles of water line</li> <li>▪ 3water booster stations</li> <li>▪ Water wells and storage</li> <li>▪ Water meter reading and replacement</li> </ul> </li> <li>▪ <u>Other Services:</u> <ul style="list-style-type: none"> <li>▪ Public Works program management</li> <li>▪ Sanitation services management</li> </ul> </li> </ul>

Table A1-2. Veolia - Dual Water and Wastewater Operations in the U.S.

Client/Location	Facilities/Operations
<b>City of Brockton, Massachusetts</b> - Ongoing since 1988	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 20.49-MGD Tertiary wastewater treatment plant</li> <li>▪ Three wastewater lift stations</li> <li>▪ Biosolids disposal program for 4,151 dry tons per year</li> <li>▪ Industrial Pretreatment Program</li> <li>▪ Septage Receiving</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ Two surface water treatment plants (1.3-MGD and 24-MGD)</li> <li>▪ 40-MGD raw water pump station</li> <li>▪ 1 MGD water well</li> </ul> </li> </ul>
<b>Discovery Bay Community Services District, California</b> - Ongoing since 2009	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 2.356-MGD Oxidation Ditch wastewater treatment plant</li> <li>▪ 50 mile collection system</li> <li>▪ 15 lift stations</li> <li>▪ Biosolids land application for 70 dry tons per year</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ Two water treatment plants (3.67-MGD and 5.76-MGD)</li> <li>▪ 53 miles of water lines</li> <li>▪ 4 water wells</li> <li>▪ 6 water storage tanks</li> </ul> </li> </ul>
<b>City of Edwardsville, Illinois</b> - Ongoing since 1987	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 4.28-MGD Envirex Activated Sludge wastewater treatment plant</li> <li>▪ 33 sewer lift stations</li> <li>▪ Stormwater/CSO Management program</li> <li>▪ Biosolids land application program for 506 dry tons per year</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 9.936-MGD groundwater treatment plant</li> <li>▪ 7 water wells</li> </ul> </li> </ul>
<b>City of Freeport, Texas</b> - Ongoing since 1995	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ Two wastewater plants (2.25-MGD trickling filter and 0.03-MGD activated sludge)</li> <li>▪ 54 miles of sewer line</li> <li>▪ 30 wastewater lift stations</li> <li>▪ Biosolids disposal for 459 dry tons per year</li> <li>▪ Industrial Pretreatment Program management</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.43-MGD water treatment plant</li> <li>▪ 7 water wells</li> <li>▪ 41 miles of water line</li> <li>▪ 2 water booster stations</li> </ul> </li> </ul>
<b>City of Greenfield, Minnesota</b> - Ongoing since 2012	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.2-MGD Extended Aeration wastewater treatment plant</li> <li>▪ Five miles of sewer line and three lift stations</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.36-MGD groundwater treatment plant</li> <li>▪ Three miles of water line</li> <li>▪ Finished water storage</li> <li>▪ Water meter reading and billing</li> </ul> </li> </ul>
<b>City of Gloucester, Massachusetts</b> - Ongoing since 2009	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 5.15-MGD chemically enhanced primary treatment and disinfection plant</li> <li>▪ 29 sewer lift stations</li> <li>▪ 440 Grinder Pump Stations</li> <li>▪ 1,272 STEP (Septic Tank Effluent Pumping) tanks</li> <li>▪ Industrial Pretreatment Program Management</li> <li>▪ Residuals Management</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ Three surface water treatment plants (two at 5-MGD and one at 1.2-MGD)</li> <li>▪ 5 Surface Water Reservoirs and 3 Water Storage Tanks</li> <li>▪ Booster Pump Station</li> <li>▪ 2 Raw Water Transfer Stations</li> </ul> </li> </ul>



Table A1-2. Veolia - Dual Water and Wastewater Operations in the U.S.

Client/Location	Facilities/Operations
<b>City of Hardinsburg, Kentucky</b> - Ongoing since 1995	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.732-MGD Extended Aeration, Oxidation Ditch WWTP</li> <li>▪ 5 Pump Stations</li> <li>▪ Collection System (20 miles)</li> <li>▪ Biosolids Liquid Land Application Program - 7.3 dtpy</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 1.2-MGD Surface Water Treatment Plant</li> <li>▪ 2.0-MGD Reverse Osmosis Groundwater Treatment Plant</li> <li>▪ 4 Pump Stations</li> <li>▪ 3 Water Wells</li> <li>▪ Water Distribution System (284 miles)</li> <li>▪ 3 Elevated Water Towers</li> <li>▪ 2 Standpipes</li> <li>▪ Clearwell (1.7 million gallon capacity)</li> <li>▪ Water Meter Reading/Meter Replacement Program and Customer Service</li> </ul> </li> <li>▪ <u>Other Services:</u> <ul style="list-style-type: none"> <li>▪ Full Public Works program management</li> <li>▪ Sanitation services management</li> </ul> </li> </ul>
<b>City of Junction City, Kansas</b> - Ongoing since 1989	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 2.5-MGD Activated Sludge wastewater treatment plant</li> <li>▪ 2.5-MGD Domestic/Industrial wastewater treatment plant</li> <li>▪ Industrial Pretreatment Program management</li> <li>▪ Septage Receiving</li> <li>▪ Biosolids Land Application Program - 990 dtpy</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 10-MGD Groundwater Treatment Plant</li> <li>▪ 10 Wells (10 million gallons capacity)</li> <li>▪ Water Pump Station</li> <li>▪ 2 Above-ground Water Storage Tanks</li> <li>▪ 2 Underground Storage Reservoir</li> <li>▪ Plant Reservoir</li> </ul> </li> </ul>
<b>City of Leominster, Massachusetts</b> - Ongoing since 1983	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 9.3-MGD Advanced Secondary Activated Sludge wastewater treatment plant</li> <li>▪ 9 Pump Stations</li> <li>▪ Industrial Pretreatment Program management</li> <li>▪ Septage Receiving and Processing</li> <li>▪ Sludge Hauling and Disposal - 1,396 dtpy</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ Three Water Treatment Plants: 4-MGD, 2-MGD and 1.2-MGD</li> <li>▪ Wellfield (1.6 MGD)</li> <li>▪ Raw Water Pump Station</li> <li>▪ Chlorination Station</li> <li>▪ 3 Clear Wells</li> <li>▪ 3 Storage Tanks</li> </ul> </li> </ul>
<b>City of Lynn, Massachusetts</b> - Ongoing since 1985 (wastewater) - Ongoing since 1987 (water)	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 25.8-MGD Pure Oxygen Activated Sludge wastewater treatment plant</li> <li>▪ 24-dtpd Fluidized Bed Incinerator</li> <li>▪ 13 Pump Stations</li> <li>▪ Industrial Pretreatment Program Sampling/Inspections</li> <li>▪ Biosolids Disposal - on-site landfill - 5,550 dtpy</li> <li>▪ Advanced Asset Management</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 15-MGD Surface water treatment plant</li> <li>▪ 3 Water Towers</li> <li>▪ 20 Million Gallon Low Service Reservoir</li> </ul> </li> </ul>
<b>City of Moore, Oklahoma</b> - Ongoing since 1993	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 9-MGD Sequencing Batch Reactor wastewater treatment plant</li> <li>▪ Collection System (295 miles)/Collection System Rehabilitation</li> <li>▪ 8 Pump/Lift Stations</li> <li>▪ Industrial Pretreatment Program management</li> </ul> </li> </ul>

Table A1-2. Veolia - Dual Water and Wastewater Operations in the U.S.

Client/Location	Facilities/Operations
	<ul style="list-style-type: none"> <li>▪ Biosolids Land Application Program - 1,970 dtpy</li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 37 Water Wells (6.249 MGD total)</li> <li>▪ 5 Water Towers</li> <li>▪ Underground Storage Tank (6.6 million gallons capacity)</li> <li>▪ Distribution System (397 miles)</li> <li>▪ Watershed Management</li> <li>▪ Water Pump Station</li> <li>▪ 2 Booster Stations</li> <li>▪ Water Meter Reading and Customer Service</li> </ul> </li> </ul>
<b>City of New London, Connecticut</b> - Ongoing since 2008	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 10-MGD Activated Sludge WWTP</li> <li>▪ Collection System (122 miles)</li> <li>▪ 8 Pump Stations</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 9-MGD Surface Water Treatment Plant</li> <li>▪ Water Distribution System (233 miles)</li> <li>▪ 6 Water Reservoirs (25,000 acres)</li> <li>▪ 5 Water Pump Stations</li> <li>▪ 5 Finished Water Storage Tanks</li> <li>▪ Water Meter Reading</li> <li>▪ Billing/Collection (14,500 accounts)</li> </ul> </li> </ul>
<b>City of Rialto</b> <b>(under private owner,</b> <b>Rialto Water Services),</b> <b>California</b> - Ongoing since 2003	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 11.7-MGD Activated Sludge WWTP</li> <li>▪ Collection System (286 miles)</li> <li>▪ Underground Asset Management</li> <li>▪ 6 Lift Stations</li> <li>▪ Industrial Pretreatment Program</li> <li>▪ Fats/Oils/Grease (FOG) Receiving and Processing</li> <li>▪ Gas Treatment System/Fuel Cells</li> <li>▪ Recycle Water Supply (Title 22)</li> <li>▪ Capital Improvement Program</li> <li>▪ Biosolids Land Application</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 5 Wells (11 MGD)</li> <li>▪ Distribution System (162 miles)</li> <li>▪ 6 Finished Water Reservoirs (28 M gallons)</li> <li>▪ 11 Booster Pump Stations</li> <li>▪ 2,000 Fire Hydrants</li> <li>▪ Customer Service, Water Meter Reading (11,700) and Billing (Water &amp; Sewer)</li> </ul> </li> </ul>
<b>Village of Smuggler's Notch, Vermont</b> - Ongoing since 1985	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.04-MGD Living Machine wastewater treatment plant</li> <li>▪ 0.168-MGD Secondary Lagoon wastewater treatment plant</li> <li>▪ Collection System (7 miles)</li> <li>▪ 5 Lift Stations</li> <li>▪ Effluent Irrigation (40 acres of forest)</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 0.15-MGD Surface Water and Groundwater Treatment Plant</li> <li>▪ Distribution System (5 miles)</li> <li>▪ 3 Pressure Booster Stations</li> <li>▪ 8 Wells (0.8 million gallons of supply)</li> </ul> </li> </ul>
<b>City of Springboro, Ohio</b> - Ongoing since 1990	<ul style="list-style-type: none"> <li>▪ <u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 4-MGD Eimco A2C wastewater treatment plant</li> <li>▪ Collection System (95 miles)</li> <li>▪ Collection System Rehabilitation</li> <li>▪ 10 Wastewater Pump Stations</li> <li>▪ Biosolids Land Application (400 dtpy)</li> <li>▪ Effluent Reuse</li> </ul> </li> <li>▪ <u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>▪ 7-MGD Anthracite Multi-media Groundwater treatment plant</li> </ul> </li> </ul>

Table A1-2. Veolia - Dual Water and Wastewater Operations in the U.S.

Client/Location	Facilities/Operations
	<ul style="list-style-type: none"> <li>4 Elevated Water Towers (3.5 million gallons capacity)</li> <li>6 Wells (2.5 million gallons of supply)</li> <li>3 Water Booster Stations</li> <li>2 PRV Stations</li> <li>2 Interconnect Pump Stations for adjacent Water Systems</li> <li>Customer Service</li> </ul>
<b>City of Spruce Pine, North Carolina</b> - Project was acquired from American Water in 2018.	<ul style="list-style-type: none"> <li><u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>2.6-MGD wastewater treatment plant</li> <li>Sewer Collection System</li> </ul> </li> <li><u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>1.6-MGD Water Treatment Plant</li> </ul> </li> </ul>
<b>Town of Sturbridge, Massachusetts</b> - Ongoing since 1989	<ul style="list-style-type: none"> <li><u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>1.3-MGD BioMag/Co-Mag Extended Aeration wastewater treatment plant</li> <li>10 Pump Stations</li> <li>Collection System (28 miles)</li> <li>750 Grinder Pump Stations</li> <li>Septage Receiving</li> <li>Industrial Leachate</li> <li>Biosolids Disposal</li> </ul> </li> <li><u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>1.6-MGD Groundwater Treatment Plant</li> <li>0.468-MGD Groundwater Treatment Plant</li> <li>4 Wells (2.068 MG)</li> <li>3 Water Storage Tanks (2.23 MG)</li> <li>2 Booster Stations</li> <li>Distribution System (28 miles)</li> <li>Meter Reading/Installation and Customer Service</li> </ul> </li> </ul>
<b>Town of Westborough, Massachusetts</b> - Ongoing since 1990 (wastewater) - Ongoing since 1996 (water)	<ul style="list-style-type: none"> <li><u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>7.68-MGD Envirex Tertiary Oxidation Ditch wastewater treatment plant</li> <li>Industrial Pretreatment Program management</li> <li>Septage Receiving and Disposal</li> <li>Industrial Leachate Processing</li> <li>Biosolids Disposal - 1,600 dtpy</li> </ul> </li> <li><u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>3.5-MGD Multi-media Filtration Surface water/Groundwater treatment plant</li> <li>2-MGD Greensand Iron/Manganese Removal Plant</li> <li>Raw Water Pump Station (2.6 MGD)</li> <li>Pressure Booster Station</li> <li>9 Wells (3.31 million gallons of supply)</li> <li>Water Storage Tanks (7.5 million gallons of capacity)</li> </ul> </li> </ul>
<b>City of Williamson, West Virginia</b> - Ongoing since 1999	<ul style="list-style-type: none"> <li><u>Wastewater O&amp;M:</u> <ul style="list-style-type: none"> <li>1.04-MGD Envirex Activated Sludge wastewater treatment plant</li> <li>23 miles of sewer line</li> <li>13 lift stations</li> <li>Storm drains, pipes and ponds</li> <li>Flood control pumps</li> <li>Flood gates</li> <li>Biosolids land application program for 90-dtpy</li> </ul> </li> <li><u>Water O&amp;M:</u> <ul style="list-style-type: none"> <li>4.1-MGD surface water treatment plant</li> <li>19 miles of water line</li> <li>4 water pump stations</li> <li>2 booster stations</li> <li>7 water storage tanks (1.983 million gallons capacity)</li> </ul> </li> </ul>

## Part 3 – Projects with Financing and Concession Types of Agreements

Veolia has also been engaged in concession and ownership types of agreements, working directly with municipalities such as yours and with private owners that have been engaged in the purchase/ transfer of water and wastewater systems under long-term agreements.

Nationally, our company's acquisitions experience traces its history back to a pioneering project in **Franklin, Ohio**.

In 1987, the Miami Conservancy District (the wastewater utility) selected Veolia to provide O&M services for the Franklin Area Wastewater Treatment Plant.

In 1995, the Franklin facility was sold by the Miami Conservancy District to Veolia, marking the nation's first transition of a municipally owned wastewater treatment plant to private ownership

In other examples of our firm's key acquisition experience, Veolia is currently working as the O&M contractor to a private owner (Rialto Water Services), which has a 30-year concession agreement with the **City of Rialto, California**, for the ownership, operation and management of their water and wastewater utility.

This O&M contract was awarded to Veolia by Rialto Water Services, LLC (RWS), the private owner of the City's water and wastewater systems under a privatization agreement that was established in 2012.

RWS, a Services Provider, was established to address the City's interest in completing critical water and wastewater system capital improvement projects and implement efficiency improvements, without adding financial risk to the City. Under the RWS concession contract, the City retains ownership of the water and wastewater systems, water rights, and the rate-setting authority. RWS provides financial backing, oversight and concession services. Veolia delivers all water and wastewater O&M services, and oversees a \$41 million capital improvement program.

Veolia's O&M contract covers the City's:

- Water treatment and distribution system - The City's water utility system receives 70% of its potable water from groundwater wells with chlorine treatment at the well heads, and the remaining 30% of the water is from other sources. Veolia routinely performs raw and finished water sampling in accordance with state regulations to identify issues with either of the water sources and solve any problems.
- Wastewater collection and treatment system - Veolia operates a wastewater system that includes an 11.7-MGD wastewater treatment plant, 286 miles of sewer lines and six wastewater lift/pump stations. Veolia also performs routine visual and CCTV inspections.
- Customer Service – Veolia is responsible for meter reading and operates a sophisticated customer service center, billing and revenue collection for more than 22,000 accounts, covering a population of approximately 100,000 people.

Under the O&M agreement, Veolia has also implemented a reliability-centered maintenance (RCM) program, registering all underground and aboveground assets into our asset management program. As part of this discipline, our O&M team performs regularly scheduled testing and analysis, annual criticality condition assessments and efficiency testing, including infrared and vibration analyses of pumps. As an example of optimization procedures in RCM, routine testing and analysis of oil is done to determine metal fragment content and viscosity to assess pump bearing wear and optimize the timing of oil changes. Veolia's RCM program approach at Rialto has reduced energy costs by \$135,000 in the first year of the O&M contract, with a projected 30% reduction in capital replacement costs through increased life expectancy of equipment.

The Rialto operation has also served as a demonstration project for the BDP® EnviroTech energy saving technology. Under this approach the project combines wastewater aeration technology and an integrated all-in-one bioreactor process. The all-in one bio-reactor saves construction costs and reduces footprint requirements when compared to traditional systems. The purpose of this demonstration project was to determine if energy consumption can be reduced. The demonstration project was funded through a grant from the California Energy Commission and was operated by Veolia's O&M team under a 12-month contract.

Prior to this, from 2003 to 2013, Veolia held an O&M only contract directly with the City of Rialto. This work began with an initial condition assessment of the utility assets in our first year of contract performance to determine the baseline condition of the assets and to identify areas requiring immediate attention to ensure reliable service and begin lowering life-cycle operation costs.

Following an initial system evaluation completed in the first year of the O&M contract with the City of Rialto, Veolia prepared a list of the utility system's 50 most critical needs for the operations. Our O&M and capital program team then



developed an annual five year prioritized implementation plan for the City, assisting them with the development of their long term Master Plan. This initial \$7 million capital improvements program developed by Veolia (covering \$4 million for the wastewater system and \$3 million for the water system) created operational savings for the City of Rialto of \$2.5 million (2003-2012). This condition assessment also identified opened zone valves that were not properly closing, causing both bleeding of water and excess operation of water pumps and booster stations. Additionally, Veolia identified valves that were not on the inventory list and not registered in the asset management program. To address these findings, Veolia's O&M team began a valve exercise program, fixing broken valves and returning valves that were stuck open to normal operation. This action significantly reduced water leaks, and in the first year of operations energy costs were reduced by an estimated \$130,000; largely as a result of pumping cost savings. Later in the contract, Veolia identified and strategically targeted the replacement of 158 high-use leaking and/or extremely inaccurate water meters, saving the City an estimated \$300,000/year in recovered water and revenue losses.

Veolia has other concession and similar types of agreements with communities such as the **City of Cranston, Rhode Island**. Under that contract, Veolia worked with the City (as the owner of the wastewater utility) to change a traditional O&M contract to utility privatization approach under a lease-management agreement with a 30-year term. That contract includes responsibility for capital planning and upgrades and long-term renewals and replacement of assets in a "full risk" model where Veolia is responsible for managing all operating and capital costs.

Additionally, Veolia partnered with the **City of Danbury, Connecticut**, under a 20-year operations contract that included concession fee that was paid by Veolia to the City. This was one of first of its kind Public-Private Partnership contracts under IRS 97-13 regulations, and involves O&M of a 15.5-MGD advanced trickling filter/activated sludge wastewater treatment facility and pump stations, septage receiving and wastewater biosolids disposal.

At the start of the contract, Veolia provided the City with a \$10 million concession fee, which the City used to close a landfill. This payment was funded directly by Veolia, protecting the City's bonding capacity. Under the agreement, Danbury continues to exercise control over its rate setting and inter-municipal agreements. City ratepayers benefit from guaranteed performance and new infrastructure while enjoying stable user fees over the two-decade term of the partnership.

The City also partnered with Veolia to develop sustainable use of reclaimed methanol for the facility's Biological Nutrient Removal (BNR) system, delivering \$30,000- \$45,000 in recurring annual savings for the City. This project involves a Massachusetts manufacturer that uses methanol to develop membranes. Although they had a distillation column on-site for methanol reclamation and reuse, the process still generates excess methanol. A Veolia sister company had been transporting used methanol to New Jersey for fuel blending until the two companies discussed ideas to develop a way to sustainably reuse the methanol, a product that Veolia was purchasing for Danbury's denitrification process. Working together with the City and regulatory agencies, Veolia and the manufacturer received all the necessary approvals for Veolia to use reclaimed methanol in the Danbury wastewater treatment process.

The result of this initiative is sustainability across the board, while costs for all parties decreased. The manufacturer saves \$225,000 annually in disposal costs; the City of Danbury saves 15%- 33% on the cost of methanol; a RCRA hazardous waste is removed from the environment for beneficial use.



Rialto Water Operations



Buffalo Water Operations

## Attachment 2: Example Documents: Project Reports

### **Rialto Water Services, CA:**

- Water Operations – 2018 O&M Annual Report and 2019-2023 Five Year Capital Plan
- Wastewater Operations – 2018 O&M Annual Report and Five Year Capital Plan

### **Buffalo Water, New York:**

- Water Operations - Monthly Report for July 2019
- Water Operations – Annual Report for 2018

**RIALTO WATER ANNUAL OPERATIONS AND  
MAINTENANCE REPORT**

**Reporting Period:**

**January 1<sup>st</sup> to December 31<sup>st</sup>, 2018**

**Prepared for: Rialto Water Services**

**Prepared by: Veolia Water West Operating Services**



## Contents

<b>INTRODUCTION .....</b>	<b>3</b>
<b>I. OPERATIONS .....</b>	<b>3</b>
1. Water Production Operational Strategy .....	3
2. Well Production .....	4
3. Basin Production and Water Rights .....	8
4. Other Sources .....	9
5. Total Production .....	11
6. Production vs. Consumption .....	166
7. Electrical Use.....	166
8. Chemical Use .....	166
<b>II. HEALTH AND SAFETY.....</b>	<b>166</b>
A. Health and Safety Program.....	16
B. Training .....	17
<b>III. COMPREHENSIVE PERFORMANCE EVALUTION SUMMARY .....</b>	<b>17</b>
A. Performance Evaluation of Administrative Practices.....	17
B. Performance Evaluation of Operational Practices .....	17
C. Performance Evaluation of Asset Management Practice .....	17
<b>APPENDIX A – Electrical Use .....</b>	<b>19</b>
<b>APPENDIX B – Chemical Use .....</b>	<b>21</b>
<b>APPENDIX C – Health &amp; Safety Training Completed in 2018 .....</b>	<b>24</b>
<b>APPENDIX D – Asset Management Maturity in 2018 .....</b>	<b>26</b>



## **INTRODUCTION**

The following report has been prepared by Veolia for Rialto Water Services (RWS) and summarizes operation and maintenance of the Rialto water system for the period of January 1, 2018 to December 31, 2018. This report has been prepared as required in Schedule B.6 of the Operations and Maintenance (O & M) Subcontract between RWS and Veolia.

### **I. OPERATIONS**

In general, water operations for the year of 2018 were normal. Beginning July 1, 2017, Veolia assumed operation of the two perchlorate treatment systems CR-3 and Chino Well 2. Both wells are a direct contract with the city. In 2018 Veolia became actively involved with another perchlorate removal project (EW-1). Another project in 2018 was to reconstruct major equipment at City Well # 2. This project started in December 2018. The well site will receive much needed improvements that will reduce chemical cost and improve reliability.

Veolia cleaned two reservoirs in 2018, the Easton Reservoir and Cedar Reservoir 1. Cedar Reservoir 2 is scheduled to be cleaned in 2019. With the completion of Cedar Reservoir 2, only Highland Reservoir would remain to be cleaned. Reservoirs are to be cleaned every five years as required by the Department of Drinking Water.

#### **1. Water Production Operational Strategy**

The overall operational strategy is to meet the daily water demand. The City of Rialto water system has six operational wells, one of which is owned by the County of San Bernardino and operated by Veolia; Oliver P. Roemer Treatment Plant (OPRTP), which is jointly owned by the City (25%) and West Valley Water District (WVWD); purchased water through the Baseline Feeder (BLF) system from San Bernardino Valley Municipal Water District (SBVMWD); and, if required to meet demand, additional water can be supplied by the City of San Bernardino (CSB) through the BLF for emergency supply only with no guarantee of actual delivery. Water produced from City Well 4A discharges into the BLF and its production is included in deliveries from that shared transmission line when City Well 4A is in service.

The following wells were operational in 2018:

- City Well #2
- City Well #4A
- Rialto Well #3
- Rialto Well #5
- Chino Well #2
- Miro Well #3

## **2. Well Production**

The table below shows monthly total, maximum, minimum, and average production from each of the six operational wells.

## 2018 WELL PRODUCTION

MONTH	CHINO 2	CITY 2	CITY 4A	RIALTO 3	RIALTO 5	MIRO 3	ACRE FT.	MILLION GALS
Jan-18	58	132	29	90	0	0	309	101
Feb-18	5	168	18	131	0	0	322	105
Mar-18	43	122	10	113	0	0	288	94
Apr-18	0	255	24	125	0	21	425	139
May-18	91	68	13	63	0	173	407	133
Jun-18	53	255	147	0	0	183	637	208
Jul-18	0	260	275	72	0	120	727	237
Aug-18	25	250	280	29	0	185	769	251
Sep-18	73	232	270	168	0	10	752	245
Oct-18	108	196	102	116	0	5	526	171
Nov-18	96	206	21	0	0	116	439	143
Dec-18	143	0	79	0	0	99	321	105
<b>TOTAL</b>	694	2143	1268	907	0	910	1343	438
<b>MAX</b>	58	255	29	131	0	21	425	139
<b>MIN</b>	0	122	10	90	0	0	288	94
<b>AVE</b>	26	169	20	115	0	5	336	109
City 4A is included in Well total.								

All table values and figures are rounded to the nearest whole number.

---

## 5 YEAR WELL PRODUCTION

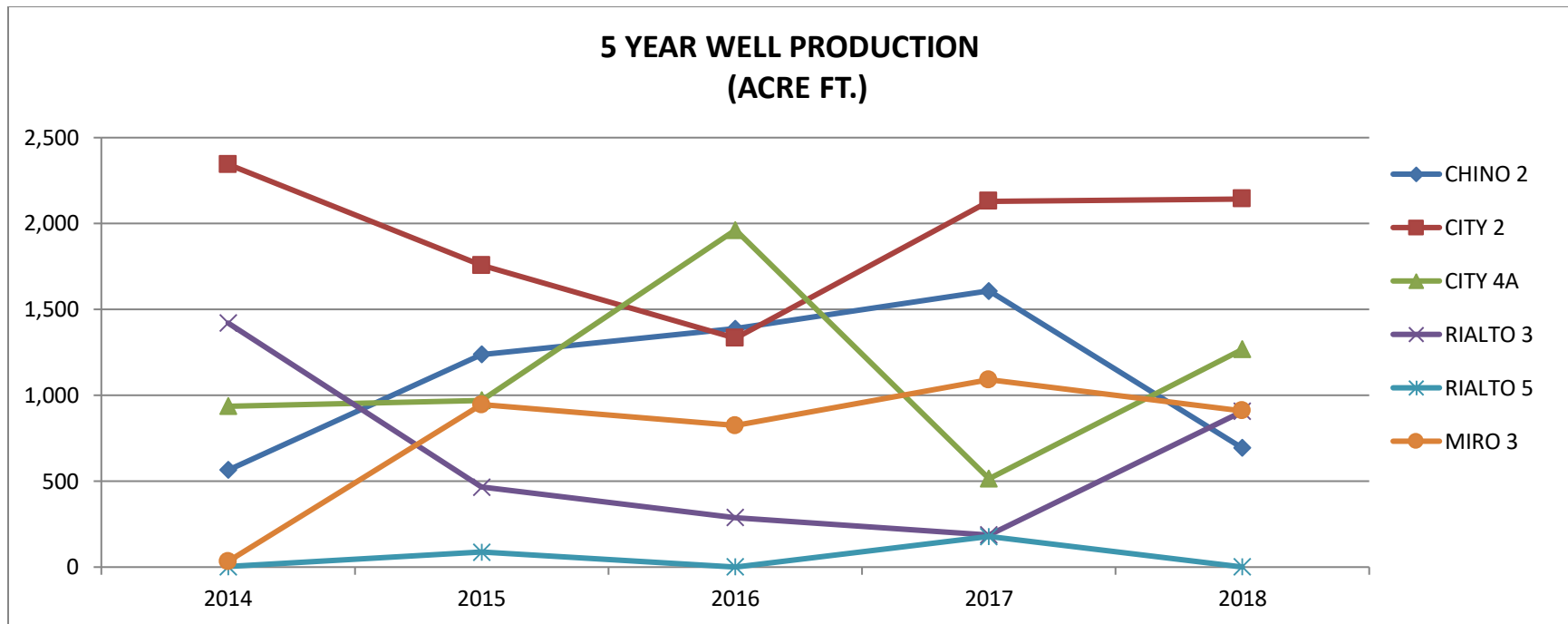
(ACRE FT.)

YEAR	CHINO 2	CITY 2	CITY 4A	RIALTO 3	RIALTO 5	MIRO 3	ACRE FT.	MILLION GALS
2014	565	2,344	937	1,421	2	33	5,302	1,728
2015	1,238	1,757	971	466	87	945	5,464	1,780
2016	1,389	1,332	1,963	289	1	823	5,797	1,889
2017	1,608	2,130	514	187	178	1,091	5,708	1,860
2018	694	2,143	1,268	907	0	910	5,923	1,930

All table values and figures are rounded to the nearest whole number.

---





- City 4A has shown to have lower TDS than BLF and when demands are low enough first priority is to run City 4A over purchasing BLF and Encanto water.
- Rialto 3 was out of service for multiple times from 2015 to 2018 for upgrades and repairs. The well had a new water flush system installed.
- Miro 3 was used to manage the Rialto Basin perchlorate remediation when Rialto 3 was out of service.

### 3. Basin Production and Water Rights

The table below shows water usage/production from each basin compared to annual water rights:

2018 BASIN USE AND WATER RIGHTS (ACRE FT.)				
BASIN	WELLS	PROD	WATER RIGHTS	
			NORMAL YR	DRY YR
<b>Lytle*</b>	City 2	2143	3683	3683
<b>Bunker Hill</b>	City 4A	1268	10000	4500
<b>Rialto</b>	Rialto 3	907	2766	1885
	Rialto 5	0		
	Miro 3	910		
<b>Chino</b>	Chino 2	694	No Limit	No Limit
(All table values and figures are rounded to the nearest whole number.)				

5 YEAR BASIN WATER RIGHTS (ACRE FT.)								
YEAR	LYTLE*		BUNKER HILL		RIALTO		CHINO	
	NORMAL YR	DRY YR	NORMAL YR	DRY YR	NORMAL YR	DRY YR	NORMAL YR	DRY YR
<b>2014</b>	9992	9992	10000	10000	2766	1587	NO LIMIT	NO LIMIT
<b>2015</b>	9992	9992	10000	2000	2766	1569	NO LIMIT	NO LIMIT
<b>2016</b>	3683	3683	10000	4500	2766	1456	NO LIMIT	NO LIMIT
<b>2017</b>	3683	3683	10000	4500	2766	2084	NO LIMIT	NO LIMIT
<b>2018</b>	3683	3683	10000	4500	2766	1685	NO LIMIT	NO LIMIT

\*Lytle does not have a dry year reduction in water rights.

Notes regarding the Rialto Basin:

- Rialto's original water rights from the Rialto basin in a normal year are 4366 acre-feet per year. However, the City leases out 1600 acre-feet per year to the County of San Bernardino.
- The dry year is declared when the water level drops below 969.7 feet above mean sea level (msl). The water levels measured in May 2018 were approximately 931.3 feet above msl which meant that 2018 was a very dry year.
- City loses 1% of water rights (based on 2846 acre-feet allotment) for each foot of water level drop below 969.7 feet above msl. Therefore, in 2018 Rialto's water rights for dry period were approximately 38% lower.

- After leasing out 1600 acre-feet to County of San Bernardino, Rialto's water rights for the 2018 dry period were  $4366 - 1520 \text{ fixed acre-feet} = 2846 \text{ acre-feet} \times .62 = 1765 \text{ acre-feet} + 1520 \text{ acre-feet} = 3285 \text{ acre-feet} - 1600 \text{ acre-feet} = 1685 \text{ acre-feet} + 200 \text{ acre-feet leased from county for groundwater treatment system} = 1885 \text{ acre-feet water rights}$ .

#### 4. Other Sources

Production from sources other than wells includes the Oliver P. Roemer Treatment Plant (OP RTP) and the Baseline Feeder (BLF).

<b>2018 OTHER SOURCES</b>				
<b>(ACRE FT.)</b>				
<b>MONTH</b>	<b>OP RTP</b>	<b>BLF (SBVMWD)</b>	<b>*ENCANTO (City of SB)</b>	<b>TOTAL</b>
<b>Jan-18</b>	107	192	0	299
<b>Feb-18</b>	100	149	0	249
<b>Mar-18</b>	94	128	0	222
<b>Apr-18</b>	108	154	0	262
<b>May-18</b>	102	212	0	314
<b>Jun-18</b>	103	121	0	223
<b>Jul-18</b>	83	167	0	249
<b>Aug-18</b>	70	126	0	196
<b>Sep-18</b>	67	56	0	123
<b>Oct-18</b>	51	164	0	215
<b>Nov-18</b>	59	203	0	262
<b>Dec-18</b>	59	156	0	214
<b>TOTAL</b>	1002	1827	0	2829
<b>MAX</b>	108	192	0	299
<b>MIN</b>	94	128	0	222
<b>AVE</b>	102	156	0	258

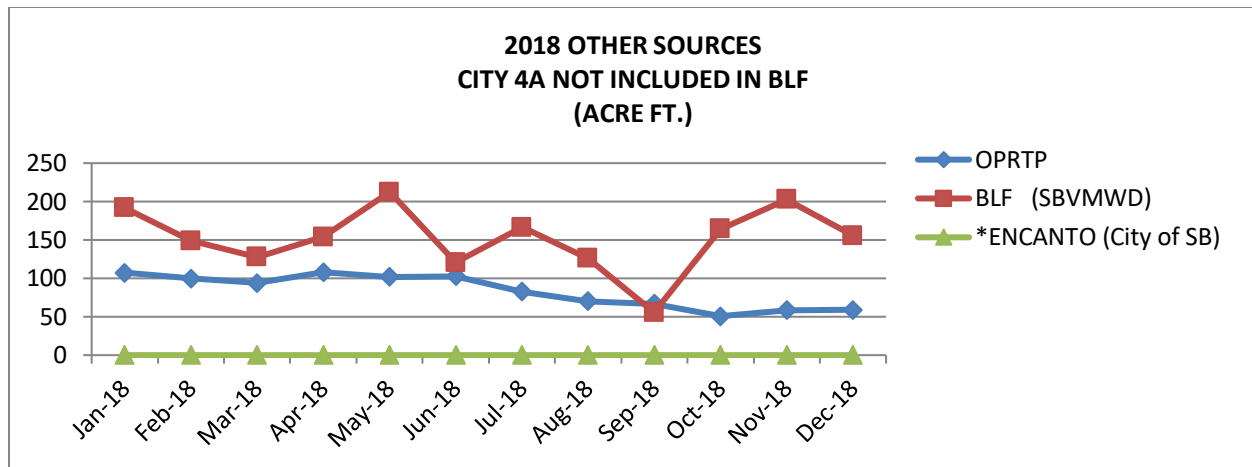
\*Encanto is included in BLF total.

\*Encanto production is based off billing.

\*Encanto's production includes monthly sampling.

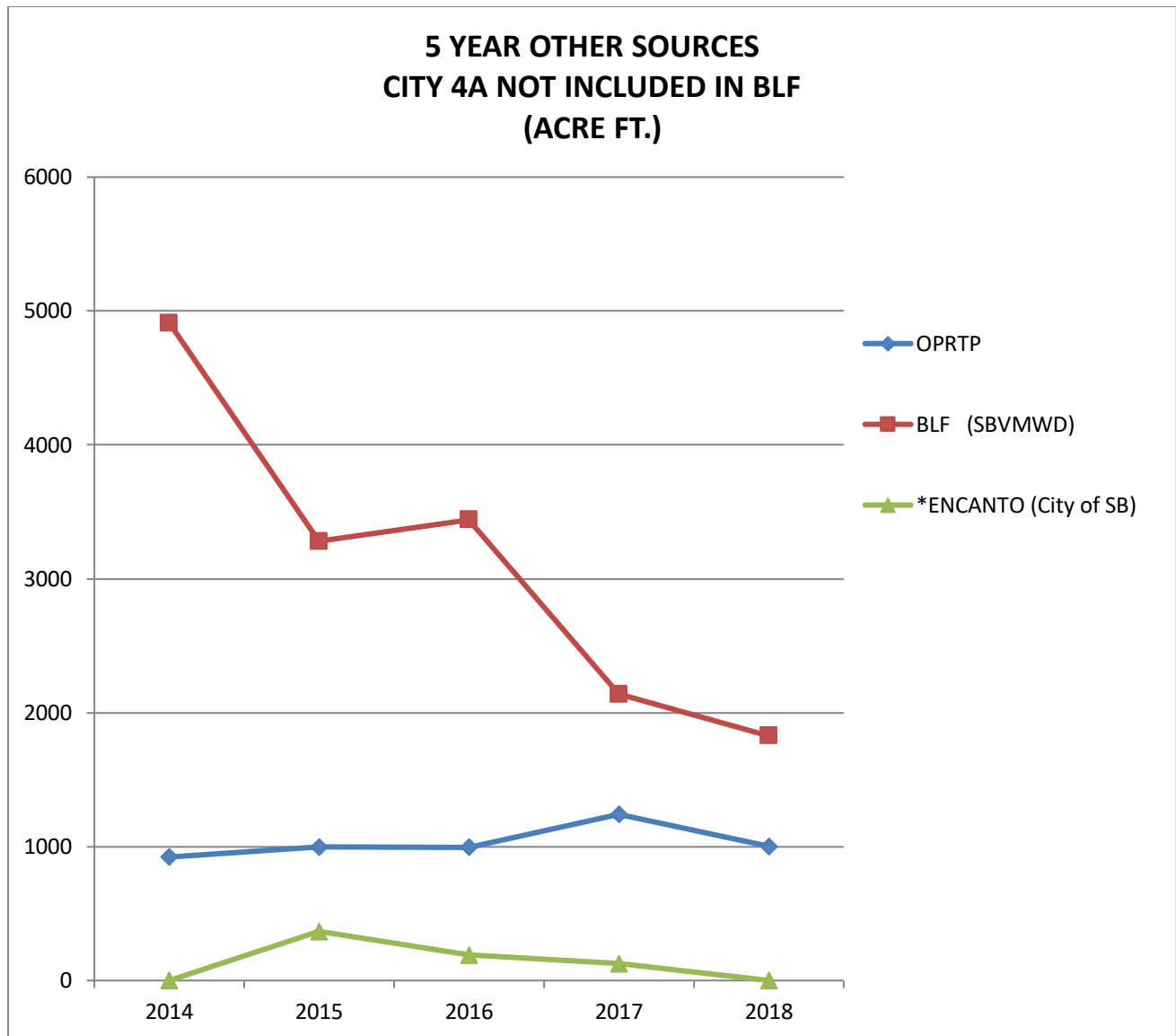
City 4A is included in Wells.

All table values and figures are rounded to the nearest whole number.



5 YEAR OTHER SOURCES (ACRE FT.)				
YEAR	OPRTP	BLF (SBVMWD)	*ENCANTO (City of SB)	TOTAL
2014	922	4911	0	5833
2015	998	3280	367	4278
2016	996	3441	191	4437
2017	1241	2139	127	3380
2018	1002	1827	0	2829
All table values and figures are rounded to the nearest whole number.				





#### 5. Total Production

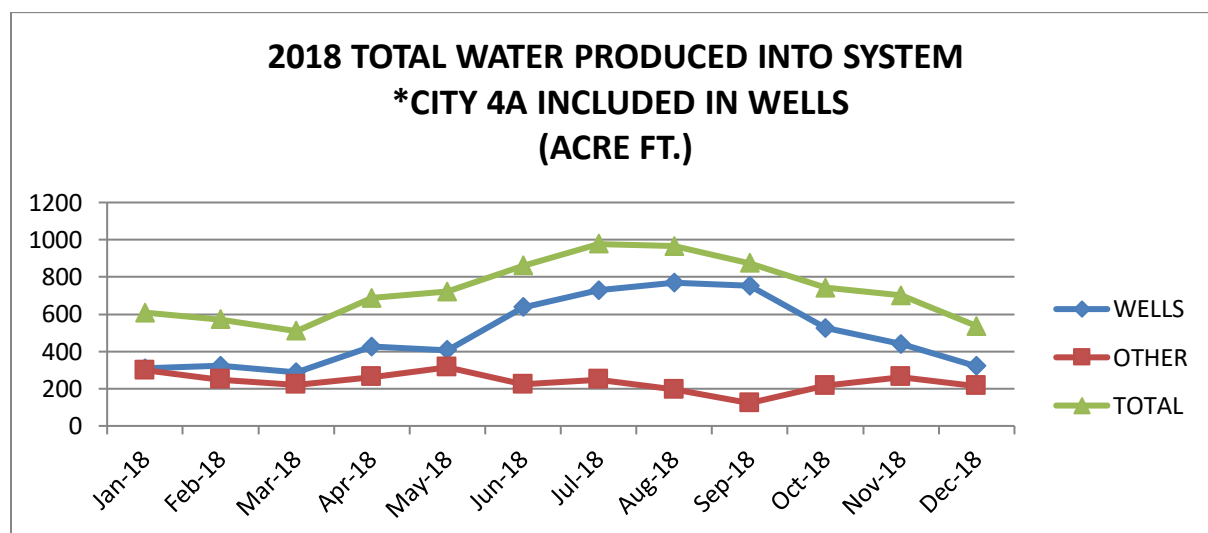
Total production for 2018 from all sources was 8751 acre-feet. The table below shows monthly water productions.

2018 TOTAL WATER PRODUCED INTO SYSTEM (ACRE FT.)			
MONTH	WELLS	OTHER	TOTAL
Jan-18	309	299	608
Feb-18	322	249	571
Mar-18	288	222	509
Apr-18	425	262	687
May-18	407	314	722
Jun-18	637	223	861

<b>Jul-18</b>	727	249	977
<b>Aug-18</b>	769	196	965
<b>Sep-18</b>	752	123	875
<b>Oct-18</b>	526	215	741
<b>Nov-18</b>	439	262	700
<b>Dec-18</b>	321	214	535
<b>TOTAL</b>	<b>5923</b>	<b>2829</b>	<b>8751</b>
<b>MAX</b>	425	299	687
<b>MIN</b>	288	222	509
<b>AVE</b>	336	258	594

City 4A is included in Well total.

All table values and figures are rounded to the nearest whole number.



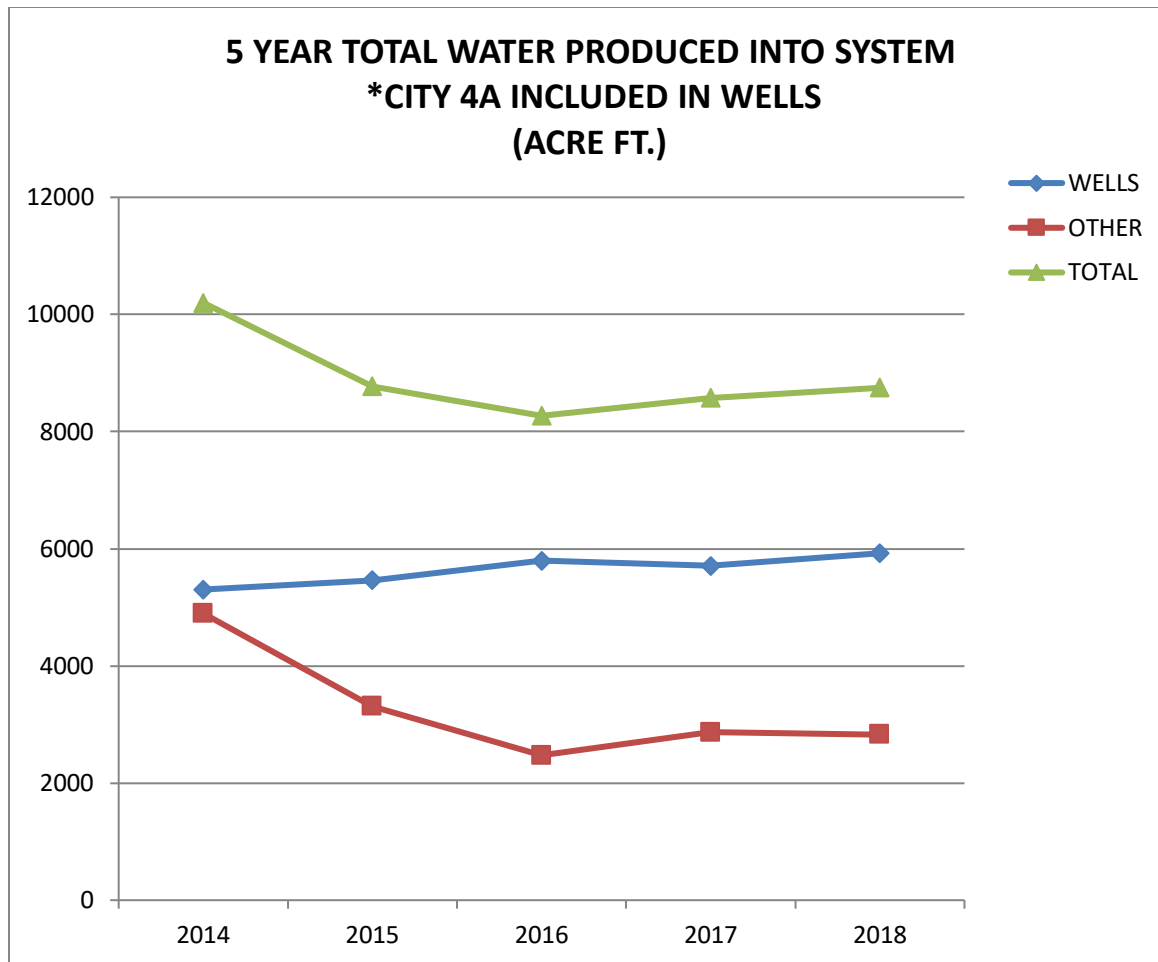
- City 4A has been included in the BLF totals in previous years.

Please note that “Other” includes production from BLF and OPRTP and “Wells” include production from six operating wells.

**5 YEAR TOTAL WATER PRODUCED INTO SYSTEM**  
**(ACRE FT.)**

<b>YEAR</b>	<b>WELLS</b>	<b>OTHER</b>	<b>TOTAL</b>
<b>2014</b>	5304	4896	10200
<b>2015</b>	5464	3307	8771
<b>2016</b>	5797	2474	8270
<b>2017</b>	5708	2866	8574
<b>2018</b>	5923	2829	8752

All table values and figures are rounded to the nearest whole number.

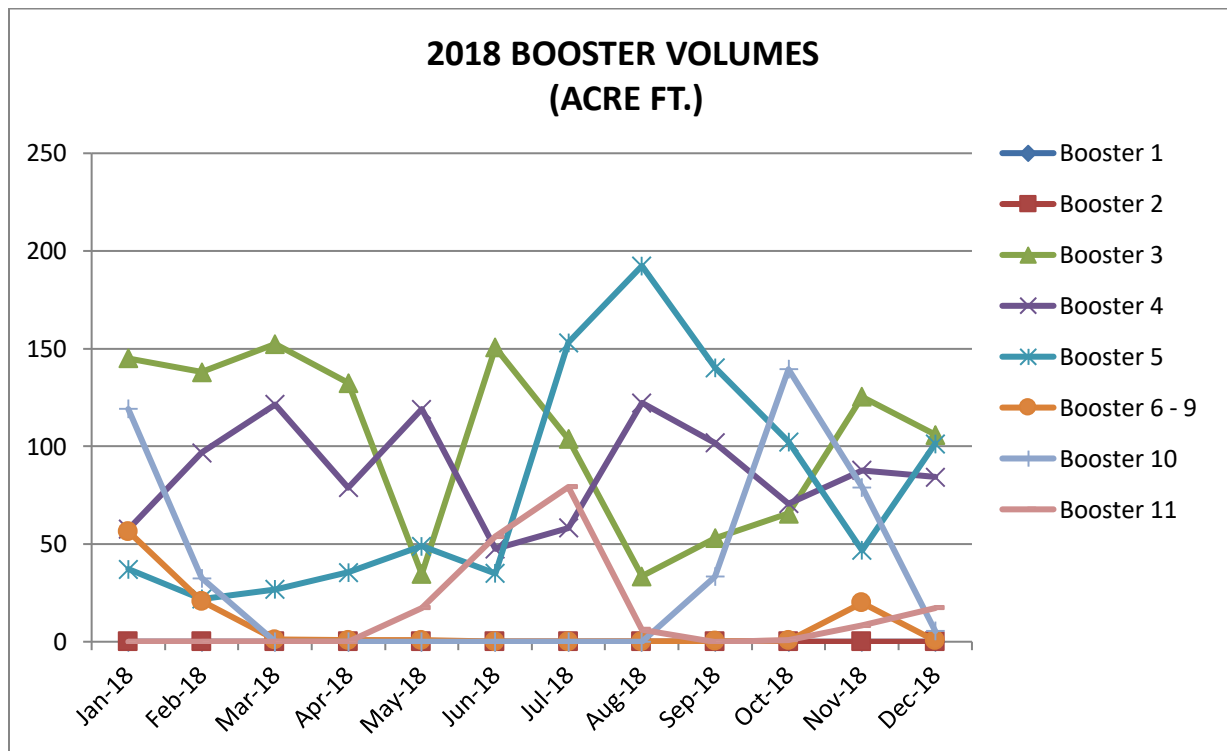


- City 4A has been included in the BLF totals in previous years.

**2018 BOOSTER VOLUMES  
(ACRE FT.)**

	Booster 1	Booster 2	Booster 3	Booster 4	Booster 5	Booster 6 - 9	Booster 10	Booster 11
Jan-18	0	0	145	58	37	56	119	0
Feb-18	0	0	138	97	22	21	33	0
Mar-18	0	0	152	121	27	1	0	0
Apr-18	0	0	132	79	35	1	0	0
May-18	0	0	35	119	49	1	0	17
Jun-18	0	0	151	48	35	0	0	54
Jul-18	0	0	104	58	153	0	0	79
Aug-18	0	0	34	122	192	0	0	6
Sep-18	0	0	53	102	140	0	33	0
Oct-18	0	0	66	71	102	1	139	1
Nov-18	0	0	125	88	47	20	79	8
Dec-18	0	0	106	84	101	1	6	17
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>1240</b>	<b>1046</b>	<b>941</b>	<b>101</b>	<b>409</b>	<b>183</b>
<b>MIN</b>	<b>0</b>	<b>0</b>	<b>132</b>	<b>58</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>MAX</b>	<b>0</b>	<b>0</b>	<b>152</b>	<b>121</b>	<b>37</b>	<b>56</b>	<b>119</b>	<b>0</b>
<b>AVE</b>	<b>0</b>	<b>0</b>	<b>142</b>	<b>89</b>	<b>30</b>	<b>20</b>	<b>38</b>	<b>0</b>

All table values and figures are rounded to the nearest whole number.



- The boosters are used to transfer water from one zone to another depending on demand.

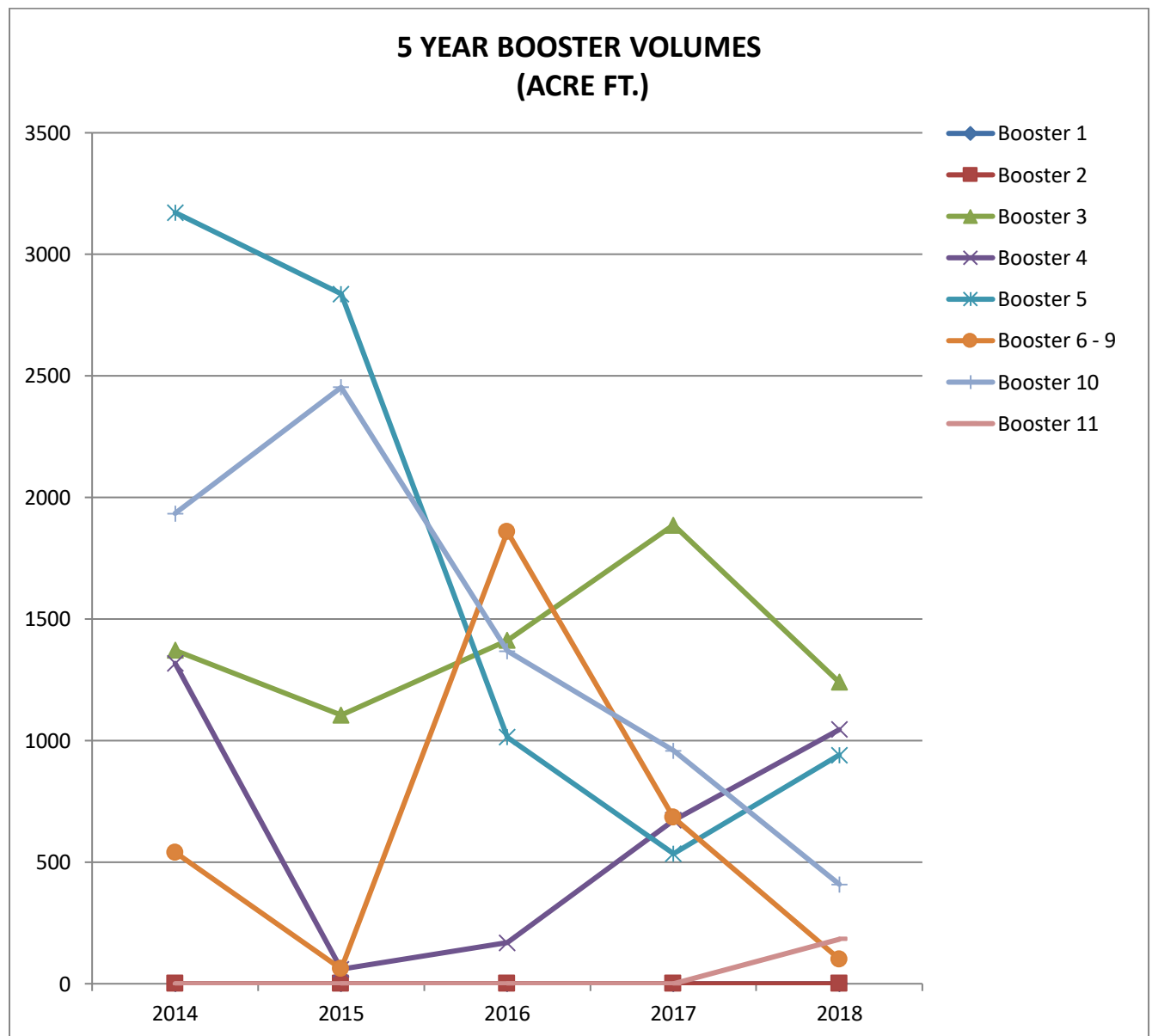


**5 YEAR BOOSTER VOLUMES  
(ACRE FT.)**

YEAR	Booster 1	Booster 2	Booster 3	Booster 4	Booster 5	Booster 6 - 9	Booster 10	Booster 11
2014	0	0	1372	1318	3172	540	1934	0
2015	0	0	1105	60	2837	61	2453	0
2016	0	0	1412	169	1014	1859	1368	0
2017	0	0	1887	672	535	684	959	0
2018	0	0	1240	1046	941	101	409	183

All table values and figures are rounded to the nearest whole number.

The downward trend is attributed corrected merging zone valves as well as less purchased water which resulted in less boosted water.



## **6. Production vs. Consumption**

Data for 2018 from the billing and collection department show a total billed consumption of 8409 acre feet. Total production for 2018 from all sources was 8751 acre-feet. Considering the volume of water produced vs consumed (billed), the non-revenue water percentage is calculated to be 3.91%.

It's generally considered in the water industry that non-revenue water less than 10% is categorized as fair to good. Staff completed a meter testing program and a full American Water Works Association (AWWA) water audit in 2018. This coupled with a continued meter replacement program helped reduce water losses.

## **7. Electrical Use**

Monthly meter readings by SCE for electrical consumption typically take place from the middle of the month to the middle of the following month. Meter readings for water production are entered on a monthly calendar basis. Therefore, electrical consumption and water production do not always trend with each other and this would be apparent in any graph, so we do not show this comparison.

## **8. Chemical Use**

Pelletized calcium hypochlorite is the only chemical added to the water system. A monthly trend of chlorine usage is shown in **Appendix B**. In 2015, the system chlorine residual was increased from an average .6 mg/L to 1.0 mg/L. This ensures that any pathogen that could be present in the system will be rendered inactive. Weekly distribution samples show the desired chlorine residual is an average of 1.0 mg/L. If a lower residual is detected, surrounding fire hydrants are flushed to bring the chlorine residual back in the 1.0 mg/L range. Future capital improvement plans recommend to convert to liquid chlorine feed systems for greater control and chemical use optimization.

# **II. HEALTH AND SAFETY**

## **A. Health and Safety Program**

All health and safety plans required by Federal and State OSHA were developed and/or revised for the Rialto Water Division. The following is a list of plans/programs currently in place at Rialto Water:

- Blood borne Pathogen
- Confined Space
- Contractor Safety
- Emergency Action Plan
- Fall Protection
- Fire Protection and Prevention Plan
- Hazard Communication
- Hearing Conservation
- Lock-Out Tag-Out
- Powered Industrial Trucks
- Personal Protection Equipment
- Respiratory Protection
- Scaffolding and Sling
- Trenching and Shoring
- Visitor Safety
- Asbestos

- Heat Stress and Cold Stress
- Defensive Driving

## **B. Training**

A listing of monthly training conducted for water staff is located in **Appendix C**.

# **III. COMPREHENSIVE PERFORMANCE EVALUTION SUMMARY**

This section describes annual comprehensive performance evaluation of administrative, operational, and asset management practices regarding Rialto Water facility operation.

## **A. Performance Evaluation of Administrative Practices**

The following information is based on the audit performed by ERA A Waters Company on behalf of Edward S. Babcock & Sons Laboratory.

In 2018, the laboratory participated in ERA's WS-222 Water Supply Proficiency Testing (PT) study. The lab participated in Performance Evaluation Studies in January and July. The laboratory had 100% acceptable data for all studies.

Weekly, monthly, quarterly and annual permit analyses were performed by Edward S. Babcock & Sons Laboratory. Contracted prices have remained consistent over the past several years. Veolia staff strives to receive the highest quality lab work at the lowest cost available without compromise.

## **B. Performance Evaluation of Operational Practices**

Veolia's Technical Solutions Group (TSG) worked with the Rialto team to update the Process Control Management Plan (PCMP) for the Water Facility. Onsite staff implements this PCMP. An internal company audit and formal training of the PCMP was completed in June 2018. Staff continues to make improvements to the living document.

## **C. Performance Evaluation of Asset Management Practice**

Each year an internal comprehensive audit is completed at the water facilities on Maintenance and Asset Management processes. The Rialto water staff has become the benchmark for InfoNet utilization, including updating the GIS layers (the X and Y coordinates) within Veolia's service territory. The team is focusing on InfoNet data quality control and better utilization of the key planning and scheduling modules. The greatest indication of Veolia's asset management maturity can be identified in the creation of the first underground BFR produced from the data collected in 2016, 2017, and 2018. The data will continue to be verified and improved as we continue to exercise valves and field verify underground assets. Overall, strong asset management foundations are in place and the programs will continue to grow and be refined

even further in 2019. The water team will continue to harmonize OWAM and InfoNet to manage both underground and aboveground assets well into 2019 and beyond.



# **APPENDIX A**

## **Electrical Use**

**Consumption is displayed in KWh**

	Address	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
1457 N. Linden Ave	Rialto Well 3	117,935	199,894	125,716	193,723	83,440	68,623	150,455	97,937	249,563	79,798	33,565	37,310
706 Plant E	City Well 1 & 2	93,078	99,819	130,105	123,044	81,830	185,423	167,204	169,616	109,450	186,616	70,340	0
224 E Easton	Highland Res.	1,159	1,354	935	1,367	1,008	1,460	1,533	1,490	1,604	1,208	1,664	638
140 W. Easton	Easton Reservoir	19	20	22	20	20	21	19	20	19	22	20	22
2610 N. Cedar Ave	Cedar Reservoir	0	0	0	672	74	78	63	70	65	75	62	63
1299 N. Riverside	Booster 3	44,890	48,524	45,499	33,822	18,119	59,300	21,076	22,779	15,321	32,332	37,914	34,552
780 W. Rialto Ave	Chino 1	79	83	71	202	67	71	64	66	62	68	64	69
335 W. Rialto Ave	Public Works	5,830	6,420	6,178	6,542	7,290	12,127	14,557	11,730	9,772	7,764	7,214	5,882
440 N. Cedar	Foothill Regulator	54	58	57	55	57	55	53	59	55	56	63	57
2600 N. Cedar	Res. Building	166	168	148	146	156	159	146	165	167	184	180	177
725 W Baseline Rd.	Booster 5	24,898	28,965	41,660	20,894	39,332	30,461	79,797	64,087	67,512	32,577	38,376	32,015
303 W. Baseline	Booster 6-10	28,633	846	784	841	855	890	831	8,817	3,066	42,909	23,557	3,841
1985 W. 9th	City 4A	20,009	258	19,785	1,959	9,068	173,576	165,164	170,310	162,163	1,873	11,470	43,529
225 Bloomington Ave	Chino Well 2	44,866	37,354	42,090	25,284	168,917	18,193	32,089	132,107	70,560	107,551	114,527	150,884
640 W. Etiwanda	Rialto Well 5	830	1,138	1,639	950	862	887	1,919	728	780	1,304	879	1,459

## **APPENDIX B**

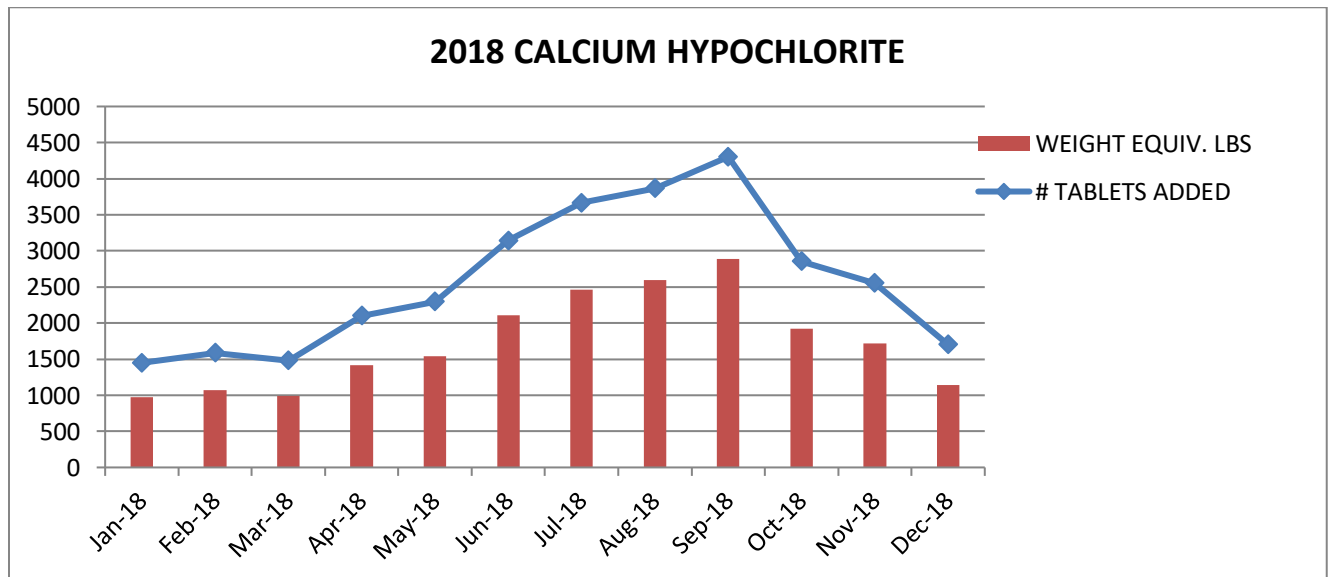
### **Chemical Use**

### 2018 CALCIUM HYPOCHLORITE

Month	# TABLETS ADDED	WEIGHT EQUIV. LBS
Jan-18	1449	974
Feb-18	1589	1068
Mar-18	1480	994
Apr-18	2103	1413
May-18	2296	1543
Jun-18	3142	2111
Jul-18	3666	2463
Aug-18	3863	2595
Sep-18	4303	2891
Oct-18	2854	1918
Nov-18	2552	1715
Dec-18	1704	1145
<b>TOTAL</b>	<b>31001</b>	<b>20830</b>
<b>MAX</b>	<b>4303</b>	<b>2891</b>
<b>MIN</b>	<b>1449</b>	<b>974</b>
<b>AVE</b>	<b>2583</b>	<b>1736</b>

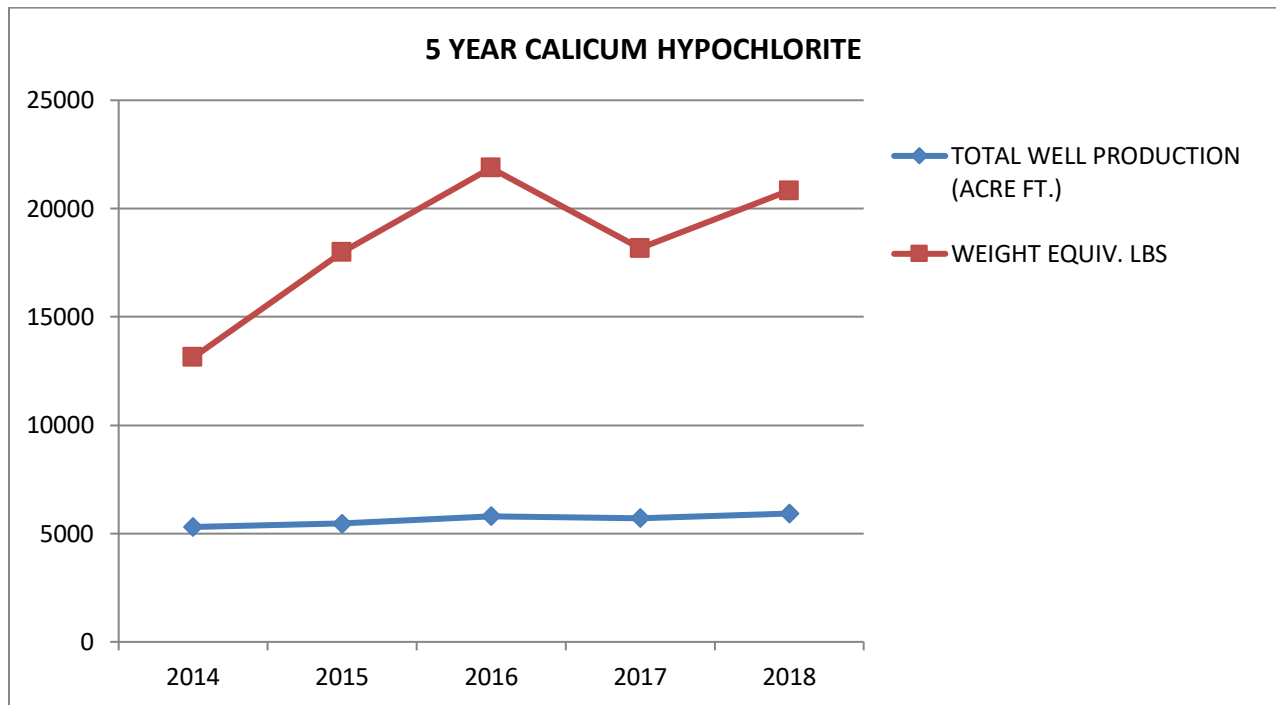
All table values and figures are rounded to the nearest whole number.

Note: Variations in amounts used per month is based on demand and the source water



### 5 YEAR CALCIUM HYPOCHLORITE

YEAR	TOTAL WELL PRODUCTION (ACRE FT.)	WEIGHT EQUIV. LBS
2014	5304	13126
2015	5464	17987
2016	5797	21872
2017	5708	18164
2018	5923	20830
All table values and figures are rounded to the nearest whole number.		





## **APPENDIX C**

### **Health and Safety Training Completed in 2018**

## Scheduled Safety Training Performed at Rialto Water in 2018

<b>January</b>	<ul style="list-style-type: none"> <li>• HazCom: What You Need to Know</li> <li>• Slips, Trips, &amp; Falls: Hazard Perception Challenge</li> </ul>	<b>July</b>	<ul style="list-style-type: none"> <li>• Heat Stress</li> <li>• Wellness and Fitness</li> </ul>
<b>February</b>	<ul style="list-style-type: none"> <li>• Fire Safety: Extinguishing Risk</li> <li>• Hot Work: Safety Operations Training</li> </ul>	<b>August</b>	<ul style="list-style-type: none"> <li>• Ladder Safety</li> <li>• Heat and Stress</li> </ul>
<b>March</b>	<ul style="list-style-type: none"> <li>• Hearing Protection: PPE Employee Essentials</li> <li>• Defensive Driving</li> <li>• M&amp;C Safety Stand Down Call</li> </ul>	<b>September</b>	<ul style="list-style-type: none"> <li>• Respiratory Protection</li> </ul>
<b>April</b>	<ul style="list-style-type: none"> <li>• Lockout/Tagout</li> </ul>	<b>October</b>	<ul style="list-style-type: none"> <li>• Scaffold Safety for General Industry</li> <li>• CPR Training</li> <li>• 2018 Emergency Drill</li> <li>• Asbestos Awareness</li> </ul>
<b>May</b>	<ul style="list-style-type: none"> <li>• Personal Protective Equipment: Employee Essentials</li> <li>• Fall Protection for General Industry</li> </ul>	<b>November</b>	
<b>June</b>	<ul style="list-style-type: none"> <li>• Confined Spaces &amp; Permit Spaces</li> </ul>	<b>December</b>	<ul style="list-style-type: none"> <li>• Bloodborne Pathogens: Safety in the Workplace</li> </ul>

## **APPENDIX D**

### **Asset Management Maturity in 2018**

The public looks to the City of Rialto, the Concessionaire (RWS) and the Contractor (Veolia) to provide sound asset management practices that help ensure that guarantee the City's infrastructure has sufficient reliability and capacity to meet present and future needs. Veolia's Asset Management program continues to align with the EPA 10 Step Asset Management Program and Veolia's global asset management principles. This section summarizes the program executed by Veolia to ensure complete life cycle management of the water assets during 2018.

#### **A. Asset Management Activities Completed in 2018**

Starting in December 2012 Veolia established InfoNet as our Computerized Maintenance Management System (CMMS), which uses geographic information (GIS), to manage our water network assets. The InfoNet System is a management database that continues to become more useful with increased usage and entry of field data. During 2018, the City had increased its growth through development projects, providing Veolia an opportunity to increase precision through the updating of InfoNet data.

##### **1. Implementation of CMMS System**

The InfoNet System used in the field by the Water Team is used to record work on City assets, above and below ground, for both Preventative and Corrective Maintenance. Updating network assets is a continuous task and during the 2018 year the team increased its total asset inventory count to over 200 records in the database. Over 400,000 updates were made to the water network system data. Using the data within the InfoNet System, the field crews utilized the GIS features to guide their maintenance efforts, uncover differences between the data and their observations and they updated these findings to the InfoNet database accordingly. Data updates are a combination of field verification, historic records review, and new development As-Builts. In 2018, 99.9% of the 222.42 miles of drinking water pipes had dimensions identified. In addition 98.8% of all 3,733 valves have dimensions identified, and 96.6% of all hydrant data has been collected and entered into the InfoNet System. System changes related to Capital Projects also went through the same process and further improved the systems precision. These system updates included the replacement of assets such as meters, piping, valves, fittings, controllers, backflows, hydrants, etc. This also included updates to the X and Y Coordinates during dig alerts and other opportunities wherever assets are exposed. Materials of construction notations were also made during asset inspections. Assets were harmonized throughout the network with updated hierarchy assignments, locations, installation dates and cost replacement values.

The team developed novel methods to manage and forecast Preventative Maintenance (PM) work orders, Predictive Maintenance Work Orders and PdM's through the use of

planning modules built into the InfoNet System. Consistent with previous years PM and PdM work orders were generated in accordance to Original Equipment Manufacturers' (OEM) specifications in addition to industry best practices. This year the team focused on planning strategies that would maximize water availability, asset reliability and material cost reductions. Release of PM intervals continued to include weekly, monthly, quarterly and annual inspections as predetermined by OEM guidance. During 2018, the water team used an InfoNet module that allowed for a City gridding technique to launch individual asset inspections. Using InfoNet's GIS capabilities, sections of the City were gridded to include individual asset PMs such as valves, meters, meter boxes, angle and curb stops, backflow devices, service lines, hydrants and sampling stations. Traditional asset management programs do not include individual PM work orders for underground assets, but Veolia is using GIS to actively inspect Rialto City grids in a proactive effort to exceed best practices. 2018 the gridding technique allowed for increase efficiency within the valve maintenance program, resulting in 1610 valves being exercised. This is an average of 134 valves being exercised monthly, which exceeded the 132 valves a month goal.

Starting in 2017 the water team received intense training, and in 2019, each technician is now more fluent in the GIS technology and the team is able to ensure accurate entries. In 2018, the team continues to be engaged in the asset management process as they strive to extend asset longevity and increase data accuracy. This engagement is evident in the over 10,151 work orders created in 2018 throughout the water distribution network.

## **2. Interface of CMMS System**

An interface was developed in 2017 with continued enhancements in 2018. This interface was fully implemented and utilized throughout 2018; allowing InfoNet to more effectively link to the OWAM CMMS system. This included stock parts that are maintained in inventory through a perpetual ledger. The team was able to more effectively track actual costs to underground assets as the interface is now fully integrated.

## **3. Update of The Baseline Facility Report**

The Baseline Facility Record (BFR) is an inventory of all Facility in-service and out-of-service aboveground assets. For the first time in 2018, the BFR includes all underground assets as well, submitted in two reports: one for aboveground assets and the other for undergrounds assets.

The aboveground BFR includes the asset ID, description, system hierarchy, equipment/structure designation, status, criticality, condition scores, useful life, install date, remaining life, replacement cost, manufacturer, building and projected overhaul cost and frequency. The data is 100% populated for each aboveground asset and reported in the BFR. Annual updates are based on repair and replacement information

logged in the OWAM CMMS. For 2018, modifications included updates to each asset for remaining life, condition and criticality as well as status change for 100 assets. 27 assets was placed in retirement and 39 additional aboveground assets were added 33 being installed and in service in 2018 and six assets were installed in 2017 but began service in 2018.

In addition to the BFR for aboveground assets, the first BFR for underground assets was created in 2018 for the over 25,000 underground drinking water assets. The report included asset information, material of construction, dimensions, installation date, life expectancy, age of pipe, current value, replacement costs, and scores for Likelihood of Failure (LOF), and Consequences of Failure (COF). In order to determine the criticality score for underground assets, the COF and the LOF parameters need to be analyzed. The COF is determined by many factors including age, condition of asset, failure history, historical knowledge, experience with the type of asset, and maintenance records regarding how the asset is likely to fail. Other factors to consider include: function, social cost, costs associated with possible secondary effects, costs of repair, and transportation costs created by the failure. The data pertaining to underground asset characteristics, assessments, and related pipe maintenance activities is managed within InfoNet, as GIS offers the best ways to track maintenance operations and to gain a better understanding of the asset registry. Unlike aboveground assets that can have visual inspections, the scoring of underground assets involves a multifaceted approach using algorithms and GIS layers to determine score.

The BRF is regularly used to optimize maintenance activities and to define Operating Repair and Replacement (OR&R) and Capital Improvement Projects (CIP). These evaluations are then used to establish Repair and Replacement Budgets as well as Capital Improvement Project recommendations over a running five-year period. Operational history is accounted for in the recommendations with a focus on projects that will improve operational efficiency and reliability. Considering repair versus replacement decisions, factors such as failure history, spares availability, energy efficiency, and new technologies are considered. The Asset Investment Strategy document summarizes the key components to the comprehensive asset management program that is utilized to carry out the proper and efficient management of the water systems. This strategy document outlines how the categorical priorities are used to determine the investment allotment across the assets.

#### **4. Condition Assessment**

Optimized maintenance is a blend of approaches targeted to ensure a required *Level of Service* within an acceptable level of risk. A systematic relative criticality analysis review was completed for Water's aboveground assets in 2013 and updated again this year. This process prioritizes assets based on rankings from a standardized scale of 1 to 5, where 1 is minor and 5 is critical, for consequence and likelihood of worst case failure

scenarios. Applying this process to each asset ensures that maintenance management and capital decisions meet the Level of Service business objectives.

Aboveground assets utilize Predictive Maintenance methods for increased scoring precision. Thermographic analysis is one example of Predictive Maintenance techniques used to quantify the condition of City assets. Veolia conducted this analysis in 2018 through Predictive Services on select assets as part of an ongoing effort to provide best practices in asset maintenance. This is an annual practice to minimize invasive maintenance which helps prolong asset life and minimize life cycle costs. Based on results, corrective maintenance was performed to correct deficiencies.

Underground network assets have a developed algorithm for likelihood and consequence of failure using factors such as number of upstream connections, supply to critical assets such as hospitals, assets that run underneath critical infrastructure such as railways or interstates, service connections, service history, failure frequency, etc.

As the team has increased their InfoNet aptitude, Veolia has been able to see trends in asset failures in areas such as leaks. From this data, staff is able to model failure rates and in turn COF and LOF assessments using potholing techniques coupled with the GIS modeling methods. This has increased the operational team's ability to respond to service line repairs. Currently, data allows for the balance between preventative replacements before leaks by managing segments in GIS grids of high risk leakers. It is not possible to prevent all leaks, but proactive replacement of service lines using data was a milestone in 2018. In addition, identifying high risk service lines has allowed the teams to decrease the time to repair (as well as reduce water loss), as the inventory has been stocked proactively with materials needed to complete urgent leakers and those areas that have high COF and LOF scores.

## **5. Maintenance and Capital Budget Reports**

A key output of the Asset Management Program is the development of the projected investment plans based on meeting the Level of Service expectations. With limited resources, it is important to ensure that developed plans are aligned with defined needs and available finances. The evaluations described in the BFR are used to establish Repair and Replacement Budgets and to generate Capital Improvement Project recommendations for the next five years. This year, the CIP plan included an extended timeline, as needed Capital Improvement Projects outpace funding and project adoption. Operational history is accounted for in the recommendations with a focus on projects that will improve operational efficiency and reliability. Repair versus replacement decisions are considered along with factors such as failure history, spares availability, energy efficiency and new technology assessments. Estimated costs to complete repairs and replacements were established using existing capital plan data and data from Veolia's corporate database as well as locally established repair cost



projections. Repair and Replacement as well as Capital Projections were submitted in 2018.

## **B. Planned 2019 Asset Management OR&R Activities**

The following summarizes planned asset management program activities for 2018

### **1. Store Room Development and Management**

Monthly inventory cycle counts were completed in 2018, and the objective for 2019 is to migrate to quarterly inventory, not that the accuracy of the Interface has been verified. The water team manages the inventory by ensuring that all components are checked out to work orders and linked to the specific asset. This one-to-one ratio allows for more accurate cost and asset history notations. In addition to monthly cycle counts, four wall-to-wall cycle count were conducted in 2018 to ensure accurate inventory and evaluate purchasing trends in order to negotiate better price points in 2019. Training of staff to control inventory flow is ongoing to help achieve more accountable best management practice techniques.

### **2. Asset Management Grid Audit Process**

Veolia has developed an Asset Management grid ranking self-assessment process that is being implemented globally. This assessment was completed for the Rialto facilities in 2018, based on the 2017 goals of increased inventory management and ensuring a one-to-one ratio of costs to work orders – and therefore assets.

The focus of 2018 was on Inventory Management and increased training through learning and development. Veolia exceeded its established goals thanks to the universal team efforts. In addition to Inventory Management, the team focused on planning a scheduling, which was evident in the exponential growth of work order and most specifically the valve exercising program. In 2019 the team will focus on anchoring the progress made in 2018.

Beginning in 2018 Veolia made major improvements with hydrant flushing. The City had reported 83 locations to the Department of Drinking water as flushing points. All identified hydrants were flushed and recorded in the CMMS system. A review of hydrant flushing program took place in December 18, 2018 to determine if the locations meet the criteria as a dead end. In 2019, the team will continue to focus on dead end inspections and correction is applicable.

### **3. Reliability Centered Maintenance (RCM) & Root Cause Failure Analysis (RCFA)**

The RCM approach is a detailed systematic approach that evaluates an asset's operational function in a manner that will yield the optimum maintenance program for the asset. RCM reviews are completed on the most critical systems and result in the correct maintenance mix of time or cycle based actions, condition based actions, and

run to failure maintenance. RCM is a proven approach that helps reduce risk and optimizes maintenance labor resources to most needed areas. Veolia completed an RCM exercise for City 4A Power and Controls. The RCM identified critical spares and potential threats to the integrity of the process. The team is working to address identified threats in 2019, and apply to the results of the RCM process to similar assets.

The RCFA is a method of troubleshooting to identify the root cause of a failure or fault and is typically applied in a reactive method after a failure event has occurred. RCFAs influenced Repair and Replacement maintenance as well as Capital Planning decisions this past year. This process, as was used for improved asset reliability and most specifically the reliability at Chino 2.

# **2019-2023 Five Year Capital Plan Rialto Water Facilities**



**Prepared by:**



**2019-2023 Capital Plan Report**  
**Rialto Water Facilities**

---

Table of Contents

1. Introduction	3
2. Proposed Projects	3
FY 2019-2020 Summary of Capital Projects	4
FY 2019-2020 Capital Project Descriptions	5
FY 2020-2021 Summary of Capital Projects	7
FY 2020-2021 Capital Project Descriptions	8
FY 2021-2022 Summary of Capital Projects	11
FY 2021-2022 Capital Project Descriptions	12
FY 2022-2023 Summary of Capital Projects	14
FY 2022-2023 Capital Project Descriptions	15
FY 2023-2024 Summary of Capital Projects	17
FY 2023-2024 Capital Project Descriptions	18
FY 2024-2029 Summary of Capital Projects	20
FY 2024-2029 Capital Project Descriptions	21
3. CONCLUSION	26

### 1. INTRODUCTION

Given the length of the contract term, it is necessary to undertake Capital Projects to modify, alter, expand or improve the Water Facility (or any portion thereof) from its then-current condition beyond what has already been identified in the current FIP projects. Based both on actual needs and Asset Management Tools, this Plan recommends Water Facility Capital Projects over the course of a five (5) year period of time from FY 2019-2020 through early half of FY 2023/2024, or in short, covering calendar years 2019 through 2024.

Each asset is evaluated based on the criticality ranking, condition ranking, anticipated remaining life projections, and level of service expectations. These evaluations are then used to establish Repair and Replacement Budgets as well as Capital Improvement Project recommendations over a five year rolling period. The Capital Plan covers project needs greater than \$125,000. Operational and maintenance history is accounted for in the recommendations with a focus on projects that will improve operational efficiency and reliability.

Based on the assessment briefly described above, capital tasks were categorized for the year in which the improvement is anticipated to be required.

### 2. PROPOSED PROJECTS

The table below is a cost summary of the proposed Capital Plan projects. Note that project costs are given a high level estimate (not engineered estimates) and each project will require a more detailed cost analysis prior to planning and initiation. All costs are present-day dollar estimates.

In the following section is a description of each project, rationale for the need, impact to operations, cost estimate, time frame, and delivery method. Below the project descriptions are cost summary tables that identify individual assets within each Capital Project.

When funding for these capital projects is secured, costs are subject to change based on further discovery during planning, design and construction bid submittal impacts. During the planning stages, staff may be better knowledgeable and able to use the Routine Repair and Replacement (RR&R) budget or the Operating Repair and Replacement (OR&R) budget to make the necessary improvements as applicable.

**FY 2019-2020  
Summary of  
Proposed Capital Improvement Projects**

Asset Description	Decision	Condition Rank	Estimated Cost
Service Valves Replacements	PM Inspection and Valve Turning	5	\$200,000
Aged Water Main Replacement Baseline Riverside to Sycamore	History of frequent leaks and adjacent to replaced segment	5	\$1,500,000
Total:			<b>\$1,700,000</b>



## FY 2019-2020

# Proposed Capital Improvement Project Descriptions

### Service Valves Replacement

**Name of Project:** Service Valves Replacement

**Problem or Opportunity:** Valve failures can occur prior to main service line failures. As we continue to perform valve exercising there will be valves that require rehabilitation or replacement.

**Assets Included:** Multiple assets to be determined through preventative maintenance activities.

**Condition Score:** 5; as determined by Preventative Maintenance and valve exercising.

**Criticality Score:** Those which have the highest criticality and poorest condition will be selected, based on inspections.

**Recommended Solution:** Identify and replace valves as necessary

**Measurable Benefits:** Ability to adjust flow and isolate/eliminate flow to clean or make repairs.

**Basis of Recommendation:** Review of failure data.

**Assumptions / Risks:** Valve exercising as well as PM inspections to create a list of potential valves.

**Primary Driver:** Asset Renewal and Water Quality

**Cost Estimate:** \$200,000 per year

**Project Period:** 2019/2020 to repeat annually based on findings

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

#### **Aged Main Replacement Baseline Riverside to Sycamore**

**Name of Project:** Aged Steel Water Main replacement Baseline Riverside to Sycamore

**Problem or Opportunity:** The water main has exceeded its lifespan and has a leak history. Additionally, the piping just west of this segment was recently replaced and it was observed that the piping was in a rapid state of decay. This project is for 1350 feet of mainline, seven valves, six service lines with meters, and five hydrant laterals with hydrants.

**Assets Included:** SV\_3930 to FIT\_1593

**Condition Score:** 5

**Criticality Score:** 5

**Recommended Solution:** Replacement of the entire aged main project approximately 1350 feet of mainline replacement, seven valves, six service lines with meters, and five hydrant laterals with hydrants.

**Measurable Benefits:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Core benefits include a reduction in risk to the public all the way down to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$1,500,000

**Project Period:** 2019/2020

**Method of Delivery:** Performed by contractor through bid process

## FY 2020-2021 Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Service Valves Replacements	PM Inspection and Valve Turning	5	\$250,000
Cedar Reservoir 2 Overhaul and Asset Renewal	PM Inspection and Asset Renewal and Life Cycle Extension	4.5	\$500,000
Booster 1 and 2 Sight Rehabilitation and Site Security	Frequent incidents of vandalism has left assets vulnerable and highly damaged	5	\$950,000
Total:			<b>\$1,700,000</b>

## FY 2020-2021

### Proposed Capital Improvement Project Descriptions

#### Service Valves Replacement

**Name of Project:** Service Valves Replacement

**Problem or Opportunity:** Valve failures can occur prior to main service line failures. As we continue to perform valve exercising there will be valves that require rehabilitation or replacement.

**Assets Included:** Multiple assets to be determined through preventative maintenance activities.

**Condition Score:** 5; as determined by Preventative Maintenance and valve exercising.

**Criticality Score:** Those which have the highest criticality and poorest condition will be selected, based on inspections.

**Recommended Solution:** Identify and replace valves as necessary

**Measurable Benefits:** Ability to adjust flow and isolate/eliminate flow to clean or make repairs.

**Basis of Recommendation:** Review of failure data.

**Assumptions / Risks:** Valve exercising as well as PM inspections to create a list of potential valves.

**Primary Driver:** Asset Renewal and Water Quality

**Cost Estimate:** \$250,000 per year

**Project Period:** 2020/2021 to repeat annually based on findings

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

#### **Cedar Reservoir 2, Overhaul, and Dome Preservation**

**Name of Project:** Cedar Reservoir 2 overhaul with life cycle preservation, extension, and asset renewal. The overhaul will include metal works, dome repairs, as to be determined during OR&R Cleaning project. This project is the second and corrective phase, as the project inspection is initiated through phase one in the OR&R 1819-02.

**Problem or Opportunity:** This is necessary to preserve the integrity of the reservoir and ensure that the asset is renewed; as it has exceeded life span by 50 years. The scope is to conduct a deep an overhaul of aged and/or defective components to extend the asset's life.

**Assets Included:** OWAM ID 2164

**Years Remaining Life:** Four years past expected life

**Condition Score:** 3

**Criticality Score:** 5

**Recommended Solution:** The Cedar Reservoir overhaul will include metal works, dome and structural repairs, and improvements as to be determined by the upcoming cleaning and inspection under OR&R 1819-02.

**Measurable Benefits:** This is a preventative measure to extend the life span of the asset.

**Basis of Recommendation:** During a routine PM the contractor, Dive Corr, noted that the tank was showing signs of wear on the exterior and interior. The inspection revealed multiple edifice corrosion as well as decline in the interior and exterior portions of the structure.

**Assumptions / Risks:** This project has an increased risk to water storage or availability during the renewal phase, so it would have to be scheduled during the low demand season. The risk of not completing this project would be unplanned catastrophic failure and loss of water storage capacity in the near future.

**Primary Driver:** Mitigation of risk that could affect water quality and capacity.

**Cost Estimate:** \$500,000

**Project Period:** 2020/2021

**Method of Delivery:** Contractor to complete scope

**Project Status:** In the scoping process pending project approval

#### **Boosters 1 and 2 Site Security and Asset Replacement**

**Name of Project:** Site Security and Asset Replacement at Booster 1 and 2

**Problem or Opportunity:** Vandals have frequented Booster 1 and 2 removing assets, wiring, and other valuables. This has continued to affect the distribution network for more than five years. A way of securing the assets to prevent theft is essential.

**Assets Included:** OWAM ID 2003

**Condition Score:** 4

**Criticality Score:** 2

**Recommended Solution:** Recommend a secured block building and fence that allows for increased security with the installation of an alarm system. It is also recommended that the replacement of all assets be included in this scope, including electrical components that have been damaged and/or stolen. Additionally, the assets will be SCADA integrated.

**Measurable Benefits:** The increased security will prevent assets from being vandalized. The Booster site will provide a method of boosting water from baseline feeder to zone 1.

**Basis of Recommendation:** Booster 1 and 2 will allow for increased network distribution capabilities in normal operations as well as redundancy during an emergency.

**Assumptions / Risks:** Though the site will increase its security, an alarm system will allow for increased monitoring and security.

**Primary Driver:** Rebuild due to age; replacement needed due to theft and vandalism

**Cost Estimate:** \$950,000

**Project Period:** 2020/2021

**Method of Delivery:** Contractor installation

**Status:** Pending City approval and updated assessment of site assets and security scope.



## FY 2021-2022

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Service Valves Replacements	PM Inspection and Valve Turning	5	\$200,000
Chino Well 1 Rehabilitation and Commissioning of Water Treatment	Return a water source to the distribution system	5	\$1,500,000
Total:			\$1,700,000

## FY 2021-2022

# Proposed Capital Improvement Project Descriptions

### Service Valves Replacement

**Name of Project:** Service Valves Replacement

**Problem or Opportunity:** Valve failures can occur prior to main service line failures. As we continue to perform valve exercising there will be valves that require rehabilitation or replacement.

**Assets Included:** Multiple assets to be determined through preventative maintenance activities.

**Condition Score:** 5; as determined by Preventative Maintenance and valve exercising.

**Criticality Score:** Those which have the highest criticality and poorest condition will be selected, based on inspections.

**Recommended Solution:** Identify and replace valves as necessary

**Measurable Benefits:** Ability to adjust flow and isolate/eliminate flow to clean or make repairs.

**Basis of Recommendation:** Review of failure data.

**Assumptions / Risks:** Valve exercising as well as PM inspections to create a list of potential valves.

**Primary Driver:** Asset Renewal and Water Quality

**Cost Estimate:** \$200,000 per year

**Project Period:** 2021/2022 to repeat annually based on findings

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

**Chino Well 1 Rehabilitation and Commissioning of Water Treatment**

**Name of Project:** Chino Well 1 Rehabilitation and Commissioning of Water Treatment

**Problem or Opportunity:** The water source has high Nitrate and Perchlorate levels, which would require the commissioning of a Water Treatment Facility. Assets at the Well would require complete assessment and rehabilitation.

**Assets Included:** OWAM ID 1341

**Condition Score:** 4

**Criticality Score:** 2

**Recommended Solution:** Rehabilitate Chino Well 1. This would require the re-commissioning of the treatment system, chlorination system, and rehabilitating of electrical and mechanical equipment.

**Measurable Benefits:** Increase to water production and reliability with an additional source of supply.

**Basis of Recommendation:** Operational data evaluation.

**Assumptions / Risks:** None

**Primary Driver:** Water Sources

**Cost Estimate:** \$1,500,000

**Project Period:** 2021/2022

**Method of Delivery:** Performed by contractor through bid process.

## FY 2022-2023 Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Service Valves Replacements	PM Inspection and Valve Turning	5	\$130,000
Service Line Replacement between Cedar and Cactus Below Etiwanda on Streets Elmwood into Sunset.	History of frequent leaks and adjacent to replaced segment	4.5	\$1,600,000
Total:			\$1,730,000

## FY 2022-2023 Proposed Capital Improvement Project Descriptions

### Service Valves Replacement

**Name of Project:** Service Valves Replacement

**Problem or Opportunity:** Valve failures can occur prior to main service line failures. As we continue to perform valve exercising there will be valves that require rehabilitation or replacement.

**Assets Included:** Multiple assets to be determined through preventative maintenance activities.

**Condition Score:** 5; as determined by Preventative Maintenance and valve exercising.

**Criticality Score:** Those which have the highest criticality and poorest condition will be selected, based on inspections.

**Recommended Solution:** Identify and replace valves as necessary

**Measurable Benefits:** Ability to adjust flow and isolate/eliminate flow to clean or make repairs.

**Basis of Recommendation:** Review of failure data.

**Assumptions / Risks:** Valve exercising as well as PM inspections to create a list of potential valves.

**Primary Driver:** Asset Renewal and Water Quality

**Cost Estimate:** \$130,000 per year

**Project Period:** 2022/2023 to repeat annually based on findings

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

**Service Line Replacement Between Cedar and Cactus Below Etiwanda on Streets: Elmwood into Sunset**

**Name of Project:** Service Line replacement between Cedar and Cactus below Etiwanda on Streets Elmwood into Sunset.

**Problem or Opportunity:** Service line laterals installed in the 1980's had a high rate of failure less than a decade after their installation due to failures in the plastic laterals. There are approximately 90 service lines and meters, 9 hydrant laterals and hydrants, and 26 valves. Over the years, 20% of the service lines have been replaced with copper. This project would focus on the approximate remaining amount of 70 service lines, 9 hydrant laterals and hydrants, and 26 service valves that require replacement.

**Assets Included:** Multiple as determined by Preventative Maintenance Activities and frequent leaks.

**Condition Score:** 4.5 is the average asset's score.

**Criticality Score:** 4.5 is the average asset's score.

**Recommended Solution:** Recommend replacing service lines between Cedar and Cactus below Etiwanda on streets: Elmwood into Sunset, and the associated assets that have not yet been replaced. There is approximately 3,300 linear feet of main pipe that branches into this project's lateral connections.

**Measurable Benefits:** Reduction of risk to the public for water delivery unplanned outage due to failure. This also mitigates the risk to residents using the streets, sidewalks, and properties adjacent to the line breaks as there will be scheduled notifications. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets, sidewalks, and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$1,600,000

**Project Period:** 2022/2023

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

## FY 2023-2024

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Service Valves Replacements	PM Inspection and Valve Turning	5	\$130,000
Service Line Replacement between Cedar and Larch below Etiwanda on Streets Victoria, Cornell, Rosewood, Church, and Folke	History of frequent leaks and adjacent to replaced segment	4.5	\$1,620,000
Total:			\$1,750,000



## FY 2023-2024

# Proposed Capital Improvement Project Descriptions

### Service Valves Replacement

**Name of Project:** Service Valves Replacement

**Problem or Opportunity:** Valve failures can occur prior to main service line failures. As we continue to perform valve exercising there will be valves that require rehabilitation or replacement.

**Assets Included:** Multiple assets to be determined through preventative maintenance activities.

**Condition Score:** 5; as determined by Preventative Maintenance and valve exercising.

**Criticality Score:** Those which have the highest criticality and poorest condition will be selected, based on inspections.

**Recommended Solution:** Identify and replace valves as necessary

**Measurable Benefits:** Ability to adjust flow and isolate/eliminate flow to clean or make repairs.

**Basis of Recommendation:** Review of failure data.

**Assumptions / Risks:** Valve exercising as well as PM inspections to create a list of potential valves.

**Primary Driver:** Asset Renewal and Water Quality

**Cost Estimate:** \$130,000 per year

**Project Period:** 2023/2024 to repeat annually based on findings

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

#### Service Line Replacement Between Cedar and Larch Below Etiwanda in Streets: Victoria, Cornell, Rosewood, Church, and Folke

**Name of Project:** Service Line replacement between Cedar and Larch below Etiwanda on Streets Victoria, Cornell, Rosewood, Church, and Folke.

**Problem or Opportunity:** Service line laterals installed in the 1980's had a high rate of failure less than a decade after their installation due to failures in the plastic laterals. There are approximately 125 service lines and meters, 10 hydrant laterals and hydrants, and 19 valves. Over the years, 50% of the service lines have been replaced with copper. This project would focus on the approximate remaining amount of 75 service lines, 10 hydrant laterals and hydrants, and 19 service valves that require replacement. This project would systematically address this section as budget allows based both on condition of mainline, and current areas of highest priority.

**Assets Included:** Multiple as determined by Preventative Maintenance Activities and frequent leaks.

**Condition Score:** 4.5 is the average asset's score.

**Criticality Score:** 4.5 is the average asset's score.

**Recommended Solution:** Recommend replacing service lines between Cedar and Larch below Etiwanda on Streets Victoria, Cornell, Rosewood, Church, and Folke as well as associated assets that have not yet been replaced. There is approximately 3,400 linear feet of main pipe that branches into this project's lateral connections, however, it is believed that the main remains in good condition.

**Measurable Benefits:** Reduction of risk to the public for water delivery unplanned outage due to failure. This also mitigates the risk to residents using the streets, sidewalks, and properties adjacent to the line breaks as there will be scheduled notifications. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets, sidewalks, and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$1,620,000

**Project Period:** 2023/2024

**Method of Delivery:** Inspections in house and repairs performed by contractor through bid process.

## FY 2024-2029

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Aged Water Main Replacement Etiwanda Riverside to Eucalyptus	History of frequent leaks and adjacent to replaced segment	5	\$4,000,000
Service Line, Hydrant Laterals, and Mainline Replacement Jackson Sycamore Pepper including Mulberry, Chestnut, Mesa, Birch and Jackson	History of frequent leaks and adjacent to replaced segment	4.5	\$5,500,000
Mainline and Service Line, Hydrant Laterals, and Mainline Replacement Below Etiwanda between Lilac and Sycamore Streets: Cornell and Victoria	History of frequent leaks and adjacent to replaced segment	4.5	\$6,000,000
Service Line Replacement, Hydrant Laterals for Palm, Orange, Olive, Date Between Foothill to Train Tracks	History of frequent leaks and adjacent to replaced segment	4.5	\$7,500,000
Service Line Replacement, Hydrant Lateral for Woodcrest, Yucca, Miramonte, Arrowhead, and Althea	History of frequent leaks and adjacent to replaced segment	4.5	\$3,500,000
<b>Total:</b>			<b>\$26,500,000</b>

#### **Aged Main Replacement Baseline Etiwanda Riverside to Eucalyptus**

**Name of Project:** Aged Water Main Replacement Baseline Riverside to Sycamore 6" Pipe installed in 1936 and is over 4,000 linear feet of pipe with 86 pipe segments, 10 hydrants and their laterals, 40 valves, and over 86 service lines.

**Problem or Opportunity:** The water main and all of its components of water distribution have far outlived their life span. OR&R Emergency projects in 2016 were completed at the intersection of Sycamore and Etiwanda that made clear the dire state of the pipe.

**Assets Included:** Numerous of the main pipe segments starting with P\_1142 to P\_15944 and all the laterals, hydrant laterals, hydrants, valves, and the service lines meters.

**Condition Score:** 5

**Criticality Score:** 5

**Recommended Solution:** Recommend the replacement of the entire aged 6" main. Approximately 4,000 linear feet of mainline replacement to include: 40 valves, 86 service lines with meters, and ten hydrant laterals with hydrants.

**Measurable Benefits:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$4,000,000

**Project Period:** 2024/2029

**Method of Delivery:** Service line Inspections in house, potholing by third party, and repairs performed by contractor through bid process.

## 2019 - 2023 Capital Plan Report

### Rialto Water Facilities

---

#### Service Line Replacement, Hydrant Laterals, and Mainline Replacement of Jackson between Sycamore to Pepper including Mulberry, Chestnut, Mesa, Birch and Jackson

**Name of Project:** Service Line replacements for laterals off of the Jackson Mainline from Sycamore to Jackson and Pepper.

**Problem or Opportunity:** The mainline at Jackson was installed in the 1980s and most of the service lines were galvanized. Failure of the service lines began within a decade of installation. Historically, over 60 service lines have been replaced in these neighborhoods. The mainline spans almost 5,000 linear feet of which includes approximately: 186 service lines with meters, 18 hydrant laterals and hydrants, and 31 valves.

**Assets Included:** Multiple

**Condition Score:** 4.5

**Criticality Score:** 4.5

**Recommended Solution:** The recommendation is replacement of all remaining laterals and service lines as well as corresponding assets that have not previously been replaced.

**Measurable Benefits:** Reduction of risk to the public for unscheduled line failures and disruption of service. Completing the needed replacement in a shorter time span benefits reduction of water quality risks and increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using streets, sidewalks, and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality issues and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$5,500,000

**Project Period:** 2024/2029

**Method of Delivery:** Service line Inspections in house, potholing by third party, and repairs performed by contractor through bid process.

#### **Mainline and Service Line Etiwanda Replacement Between Lilac and Sycamore Below Etiwanda on Streets Cornell and Victoria**

**Name of Project:** Service Line with meters, hydrant laterals and hydrants, and Etiwanda Mainline Replacement below Etiwanda between Lilac and Sycamore Streets: Cornell and Victoria

**Problem or Opportunity:** Service line laterals installed in the 1950's have outlived their expected lifespan and this project will allow us to control the replacement rather than just mitigation of failures. There are approximately 190 service lines and meters, 17 hydrant laterals and hydrants, and 34 valves. Over the years, 12% of the service lines have been replaced with copper. This project would focus on the approximate remaining amount of 167 service lines, 17 hydrant laterals and hydrants, and 34 service valves that require replacement. There is approximately 8,000 linear feet of main pipe that branches into this project's lateral connections. Further OR&R Projects must be established to determine the exact amount of mainline in need of repair.

**Assets Included:** Multiple as determined by Preventative Maintenance Activities and frequent leaks.

**Condition Score:** 4.5 is the average asset's score.

**Criticality Score:** 4.5 is the average asset's score.

**Recommended Solution:** Recommend replacing service lines between Cedar and Cactus below Etiwanda on streets: Cornell and Victoria, and the associated assets that have not yet been replaced. There is approximately 8,000 linear feet of main pipe that branches into this project's lateral connections.

**Measurable Benefits:** Reduction of risk to the public for water delivery unplanned outage due to failure. This also mitigates the risk to residents using the streets and sidewalks and properties adjacent to the line breaks as there will be scheduled notifications. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$6,000,000

**Project Period:** 2024/2029

**Method of Delivery:** Service line Inspections in house, potholing by third party, and repairs performed by contractor through bid process.

#### **Service Line Replacement, Hydrant Laterals, for Palm, Orange, Olive, and Date Between Foothill to the Train Tracks**

**Name of Project:** Service line, meters, hydrant laterals and hydrants replacement on Palm, Orange, Olive, and Date between Foothill and the Train Tracks.

**Problem or Opportunity:** World War II era lateral piping is still in service and must be replaced as a large project before failure. This pipe has exceeded its expected service life and some failures have already occurred. Historically, there have been over 40 laterals that have been replaced due to leaks, but the remainder of the lines should be scheduled for replacement as one project. This is approximately 7,000 linear feet of piping, 340 service lines and meters, 40 hydrant laterals and hydrants, and 107 valves.

**Assets Included:** Multiple

**Condition Score:** 4.5

**Criticality Score:** 4.5

**Recommended Solution:** The aged main project would identify 7,000 feet of mainline pipes in conditions that require replacement, to including: valves, laterals, and hydrants. This would be based on assessments during valve exercising and analysis of segments with frequent leaks.

**Measurable Benefits:** Reduction of risk to the public for water delivery unplanned outage due to failure. This also mitigates the risk to residents using the streets, sidewalks, and properties adjacent to the line breaks as there will be scheduled notifications. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets, sidewalks, and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$7,500,000

**Project Period:** 2024/2029

**Method of Delivery:** Service line Inspections in house, potholing by third party, and repairs performed by contractor through bid process.



#### **Service Line Replacement close to Triangle of Bloomington, Cactus, San Bernardino on Streets: Woodcrest, Yucca, Miramonte, Althea, Manzanita, and Arrowhead**

**Name of Project:** Service Line with meters, hydrant laterals and hydrants, and Mainline Replacement at Streets: Woodcrest, Yucca, Miramonte, Althea, Manzanita, and Arrowhead.

**Problem or Opportunity:** Service line laterals installed in the late 1980 to late 1990's had a high rate of failure less than a decade after their installation due to failures in the plastic laterals. There are approximately 140 service lines and meters, 10 hydrant laterals and hydrants, and 24 valves. Over the years, 17% of the service lines have been replaced with copper. This project would focus on the approximate remaining amount of 115 service lines, 10 hydrant laterals and hydrants, and 24 service valves that require replacement.

**Assets Included:** Multiple as determined by Preventative Maintenance Activities and frequent leaks.

**Condition Score:** 4.5 is the average asset's score.

**Criticality Score:** 4.5 is the average asset's score.

**Recommended Solution:** Recommend replacing service lines in the triangle created with Bloomington, San Bernardino, and Cactus on streets: Woodcrest, Yucca, Miramonte, Althea, Manzanita, and Arrowhead, and the associated assets that have not yet been replaced. There is approximately 3,900 linear feet of main pipe that branches into this project's lateral connections.

**Measurable Benefits:** Reduction of risk to the public for water delivery unplanned outage due to failure. This also mitigates the risk to residents using the streets, sidewalks, and properties adjacent to the line breaks as there will be scheduled notifications. Benefits include the reduction of water quality risks and an increase in reliability for fire services.

**Basis of Recommendation:** Reduction of risk to the public using the streets and sidewalks and properties adjacent to the line breaks. Core benefits include a reduction in the risk to water quality problems and fire services.

**Assumptions / Risks:** Normal construction risks associated with unknown underground assets.

**Primary Driver:** Water quality and reliability of the water distribution network.

**Cost Estimate:** \$3,500,000

**Project Period:** 2024/2029

**Method of Delivery:** Service line Inspections in house, potholing by third party, and repairs performed by contractor through bid process.

### **3. CONCLUSION**

The Asset Management program and operations hands on team reviews are utilized to develop these CIP recommendations and proposed schedules. To date, no funding mechanism has been put in place by the City to move these projects forward. RWS understands that City staff is working with City Council to review and set rates necessary to complete as many as possible Capital projects.

# **RIALTO WASTEWATER ANNUAL OPERATIONS AND MAINTENANCE REPORT**

**Reporting Period:**

**January 1, 2018 through December 31, 2018**

**Prepared By: Veolia Water West Operating Services, Inc.**



**Prepared For: Rialto Water Services**



## Table of Contents

A.	INTRODUCTION/CONCESSION AGREEMENT TO DATE .....	1
B.	OPERATIONS SUMMARY .....	1
B.1.	Wastewater Plant Flows .....	2
B.2.	Biochemical Oxygen Demand (BOD) .....	3
B.3.	Total Dissolved Solids (TDS) .....	3
B.4.	Total Suspended Solids (TSS) .....	3
B.5.	Reclaimed Water Flow .....	4
B.6.	Sewer Cleaning and .....	4
B.7.	FOG (Fats, Oils and Grease) .....	4
B.8.	Biosolids Production .....	4
B.9.	Chemical Usage .....	4
B.9.1.	Sodium Hypochlorite .....	5
B.9.2.	Sodium Bisulfite .....	5
B.9.3.	Ferrous Chloride .....	5
B.9.4.	Gravity Belt Thickener Polymer .....	5
B.9.5.	Belt Filter Press Polymer .....	5
B.9.6.	Coagulant Alum .....	6
B.10.	Electrical and Gas Usage .....	6
C.	REGULATORY COMPLIANCE .....	6

## **Appendices**

Appendix A	Influent and Effluent Flow Data .....	A-1 – A-2
Appendix B	Influent and Effluent BOD Data.....	B-1 – B-6
Appendix C	Influent and Effluent TDS Data .....	C-1 – C-2
Appendix D	Influent and Effluent TSS Data for 2018 .....	D-1 – D-6
Appendix E	Reclaimed Water Data.....	E-1 – E-2
Appendix F	Sewer Cleaning and Televising Data.....	F-1 – F-2
Appendix G	Fats Oils and Grease (FOG) Data .....	G-1 – G-2
Appendix H	Biosolids Data.....	H-1 – H-2
Appendix I	Chemical Data .....	I-1 – I-12
Appendix J	Utilities Data.....	J-1 – J-6
Appendix K	Asset Management.....	K-1 – K-10

# **RIALTO WASTEWATER ANNUAL OPERATIONS AND MAINTENANCE REPORT**

---

## **A. INTRODUCTION/CONCESSION AGREEMENT TO DATE**

Pursuant to the requirements set forth in Schedule A.6 of the O&M Subcontract, Veolia North America (Veolia) is pleased to submit this Wastewater System Annual Report (Annual Report) to Rialto Water Services, LLC (RWS). As reviewed in last year's Annual Report, this report will focus on the years that Veolia has provided operations and maintenance services under the Concession Agreement through the 2018 calendar year. Where significant variances have occurred, notations will be provided.

## **B. OPERATIONS SUMMARY**

This section summarizes the wastewater plant's (WWTP) operations and provides information about: influent and effluent flows, water quality, quantities of electricity, natural gas and chemicals used, and other reportable matters for this reporting period.

In 2018, with a single exception, WWTP operations remained compliant with NPDES Permit, AQMD Permit, and other requirements in all areas where the staff could effectively manage equipment O&M and wastewater process control adjustments to avoid violations. Aging facility equipment continued to challenge the Rialto wastewater facility staff in 2018 to maintain compliance. Prudent use of provided OR&R funds has assisted in addressing urgent maintenance needs. The single instance of non-compliance resulted in an exceedance of the AQMD permit's Sulfur compounds discharge limit. Review of the circumstances preceding this incident indicates that a combination of highly unusual factors triggered the anaerobic digester upset that resulted in the exceedance. Process modifications as well as enhancements to monitoring procedures have been instituted to minimize the potential for repetition of this incident.

An objective for 2018 was to further develop team based integration of activities by all staff. In addition to the weekly Process Control Management meetings instituted last year, additional review/planning meetings have been instituted:

- Monthly staff based Safety Committee meetings to focus and review site safety concerns
- Daily Lead Operator/Maintenance Planner Scheduler meeting to set priorities for equipment repairs and servicing
- Standardization of ensuring that each staff member attending weekly meetings, training sessions, etc. is given an opportunity to have their specific concerns aired as part of the group

Several significant maintenance tasks were completed. These include:

- In a manner similar to that undertaken in 2017 with Plant 4's aeration system, the aeration system for Plant 3 was taken off line, aeration tank cleaned of debris, sluice gates repaired and adjusted, manifold piping repaired, ceramic diffusers removed, cleaned, and replaced, system tested for integrity, and returned to service. While not a comprehensive rebuild, this work is expected to dramatically reduce the volume of air wasted due to leakage and should provide more balanced treatment.
- Following a failure of the drive motor for one of the main aeration blowers, an aeration system shutdown was scheduled during which the motor was replaced, a failed check valve repaired, and the discharge shut off gate valve inspected.
- In an effort to provide more efficient and precise management of air feed to the Plant 5 aeration system, an upgrade to the SCADA control system was performed which regulates aeration blower operation based on aeration tank oxygen concentrations. This upgrade should reduce blower operation, consume less electricity, and provide improved management of the Plant 5 aeration process.
- In a joint effort by the City of Rialto, Southern California Edison, and Veolia, a significant upgrade to the electrical service provided to the treatment plant was performed. This required shutdown of the plant over a two day period, transference to temporary power generators and return of the plant to utility power once the upgrade was completed. This complex task was accomplished successfully with no effluent or performance issues.

A significant milestone was achieved in September with the official groundbreaking of the S1 construction project. This project, scheduled for completion in mid-2020, will significantly upgrade the equipment used for wastewater treatment. It is anticipated that existing Plants 2, 3, and 4 will be decommissioned once the S1 project completes.

In 2018, the City of Rialto authorized funds to rehabilitate Anaerobic Digester #1. A purchase order for this work was issued. It was anticipated that the work would commence in December, 2018 however required replacement instrumentation did not arrive in a timely manner to allow the work to commence as planned. It is anticipated that the needed equipment will arrive in early 2019 and the rehabilitation project be completed in the first quarter of the year.

## **B.1. Wastewater Plant Flows**

2018 recorded an influent wastewater plant flow effectively identical to the average of prior years. Effluent flow was slightly lower than the all-years average but well within the normal range. Flow differential between influent and effluent flows was also slightly higher than the all-years average but again well within the range typical for the flow metering equipment at the plant. The reader is reminded that flow



meters typically have a +/-5% accuracy range which, when comparing two meters, can have as great a differential as 10%. As in past years, flows meters are calibrated annually by a qualified outside contractor. Flow tabulation is displayed in Appendix A, Page A1.

Appendix A, Page A2 provides a summary of annual average flows for the years 2011 through 2018. By comparison, 2018's influent and effluent average flows were well within the normal range and nearly equal to the all-years average.

Lastly, the reader is reminded that the currently ongoing S1 upgrade project will replace both influent and effluent flow meters. The current construction schedule calls for project completion in mid-2020. 2019 flows should be unaffected by this construction.

## **B.2. Biochemical Oxygen Demand (BOD)**

Biochemical Oxygen Demand (BOD) is one of the two most frequently used parameters for measurement of wastewater treatment facility performance. For 2018, monthly influent BOD concentration evidenced the slow increase as seen in prior years. Effluent BOD concentration continues to be extremely low and well below permit requirements. Overall influent and effluent BOD concentrations fall in the normal range for a wastewater treatment plant. and effluent BOD values fell within normal ranges. BOD removal percentage continues to be high, well above permit requirements.

## **B.3. Total Dissolved Solids (TDS)**

In recent years, regulatory agencies have increased their focus on Total Dissolved Solids (TDS) concentrations in water. TDS are present in nearly all water sources. The water wells that are used by the City of Rialto are typical of those in the area which tend to possess high TDS concentrations. These solids are therefore present in the influent wastewater stream. While wastewater treatment processes present at the Rialto facilities weren't specifically designed to remove TDS, some reduction does occur. However, the wastewater disinfection process, which precedes discharge of facility effluent, increases TDS levels, often exceeding effluent permitted concentrations. However, the California Regional Water Quality Control Board (RWQCB) has identified a point prior to disinfection as the TDS effluent monitoring location. Using this monitoring location, effluent TDS for 2018 was consistently compliant. Appendix C provides influent and effluent TDS concentrations for 2018 and for prior years.

## **B.4. Total Suspended Solids (TSS)**

Total Suspended Solids (TSS) is the second of the two most frequently used parameters used to measure treatment facility performance. For 2018 as shown in

Appendix D, TSS reduction was well above and effluent concentrations were well below specified permit limits.

#### **B.5. Reclaimed Water Flow**

Reclaimed water is used by Caltrans for landscape irrigation. In May, construction work on the BDP research project caused a cessation in reclaimed water transmission to Caltrans. Potable water was supplied for the remainder of the year.

Data is provided in Appendix E.

#### **B.6. Sewer Cleaning and**

General collection system cleaning and attention to sewer system hot spots (sewer locations that require frequent maintenance) for 2018 are presented in Appendix C. Approximately 77.9 miles of sewer were cleaned in 2018 using conventional methods. Using an advanced technology acoustic monitoring unit (called an SL-RAT), an additional 15.0 miles of sewer were monitored. 18.9 miles of hot spot cleaning was also performed.

Appendix C, Page C-2 presents a summary of collection system and hot spot cleaning from 2011 through 2018. 2018 inspection rates were in keeping with prior years. Note that 2011 through 2014 hot spot inspections were not separately recorded.

Contractual requirements call for a Closed Circuit Television Inspection (CCTV) of a minimum of 26 miles of sewer per year. In 2018, Veolia staff inspected a total of 27.5 miles of sewer, well higher than the minimum required.

#### **B.7. FOG (Fats, Oils and Grease)**

Deliveries of Fats, Oils, and Grease (FOG) were consistent through mid-April 2018 when all parties agreed to temporarily cease acceptance of FOG. Total FOG received in 2018 was a total of 0.56 million gallons. FOG data is presented in Appendix G.

#### **B.8. Biosolids Production**

2018 was unremarkable with respect to Biosolids hauling. Appendix H, Pages H-1 and H-2 respectively provide a summary of 2018 and 2011 through 2018 tons of solids hauled.

#### **B.9. Chemical Usage**

Chemicals are routinely used at wastewater treatment facilities. The Rialto plant is typical in that regard. Cost of chemicals consumed is an ongoing operating concern. Usage is tracked month to month to ensure that efficiencies are maintained. Each chemical used in the treatment process is reviewed individually in Appendix I.

#### **B.9.1. Sodium Hypochlorite**

Sodium hypochlorite is used for effluent disinfection. 2018 usage remained effectively stable as compared to prior years.

#### **B.9.2. Sodium Bisulfite**

Sodium bisulfite is injected into the effluent stream following sodium hypochlorite disinfection to eliminate the impact of the disinfection chemical on the receiving water (the facility's permit limits require that no active hypochlorite be in the effluent). 2018 evidenced an ongoing decrease in sodium bisulfite usage resulting from improved operational efficiencies.

#### **B.9.3. Ferrous Chloride**

Ferrous chloride is used to reduce the impact of hydrogen sulfide generated in the treatment facility's sludge anaerobic digester. Issues during 2018 in managing the balance of digester volatile acids and alkalinity resulted in an increase in ferrous chloride consumption.

#### **B.9.4. Gravity Belt Thickener Polymer**

Polymer, an artificially created chemical, is mixed with biosolids (or sludge) removed from the wastewater stream to aid in removal of water. The portion of biosolids produced by the secondary (activated sludge) treatment process is pretreated prior to feeding to the anaerobic digester using a gravity belt thickener. Under normal operation, a gravity belt thickener will increase the concentration of solids in the waste stream from approximately 1% to 4 to 6%. The increase of polymer used in 2018 is the result of a number of factors however the most significant are the volume of secondary waste solids produced and the comparative difficulty in producing the desired thickening of the waste stream.

#### **B.9.5. Belt Filter Press Polymer**

Following the anaerobic digestion process, removal of as much water as possible from the biosolids reduces the volume and weight of material which must be trucked off site for disposal. A belt filter press is used to perform this process. Mixing of polymer with biosolids increases the effectiveness of the dewatering process.

Belt filter press polymer consumed in 2018 was effectively equal to that used in 2017 and matches recent years' usage.

#### **B.9.6. Coagulant Alum**

Injection of alum into the wastewater effluent stream is required by the facility permit during some operating circumstances. In 2018, alum consumption was approximately half of that consumed in 2017. As the unique conditions which require feeding of alum are unpredictable, it is unknown if this reduction in usage will continue in 2019.

#### **B.10. Electrical and Gas Usage**

Consumption of electricity and natural gas are significant costs in treatment plant operation. In 2018, electrical consumption at the wastewater treatment plant was effectively unchanged from 2017 and prior years. This is a testimonial to stable facility operations.

Power usage at the six Rialto lift stations was more variable. This is largely attributed to mechanical issues at a few of the stations. These issues resulted in decreases in electrical consumption.

Natural gas is used to maintain the temperature of the anaerobic digester. Variations year to year are largely related to the coldness of winter temperatures. 2018 gas consumption was effectively identical to gas consumed in the prior two years.

### **C. REGULATORY COMPLIANCE**

In terms of regulatory compliance, 2018 was very good. One air permit compliance exceedance was experienced.

In April, a combination of factors resulted in an exceedance of the sulfur compounds discharge limitation in the South Coast Air Quality Management District air permit for the plant's digester gas flare system. The exceedance prompted a comprehensive review of digester monitoring procedures. New procedures were instituted as a result which should preclude repetition of the operational aspects of this incident.

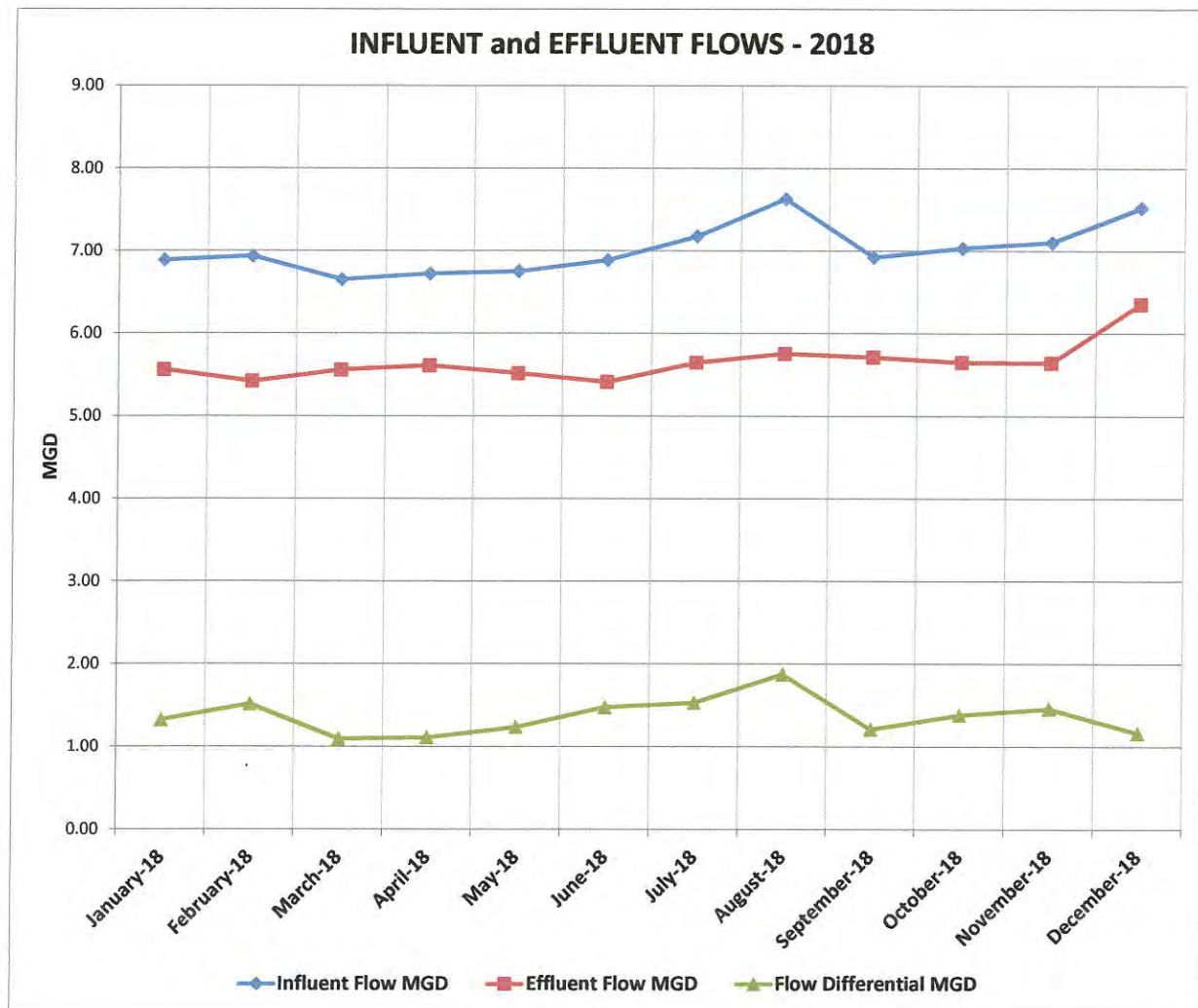
As discussed in Section 2.3 above, although compliant in 2018, an ongoing concern continues to be effluent Total Dissolved Solids (TDS) concentration. TDS are present in the potable water supplied to Rialto water users. Although careful management of water source wells reduces TDS concentrations, the influent wastewater remains very high in TDS. While wastewater treatment prior to sodium hypochlorite disinfection will reduce TDS below the permit limit, the disinfection process inherently increases TDS levels. At this time, the California Regional Water Quality Control Board considers the pre-disinfection TDS concentration as the

compliance parameter. However, no guarantees exist that the Regional Board will retain this interpretation. This issue, which is shared with a number of nearby treatment facilities, remains a concern. Recently, the Regional Board extended the existing NPDES wastewater treatment permit through completion of the S1 sewage treatment facility upgrade project in 2020. While this is the case, there is no assurance that TDS limitations will be retained through 2020.

APPENDIX A

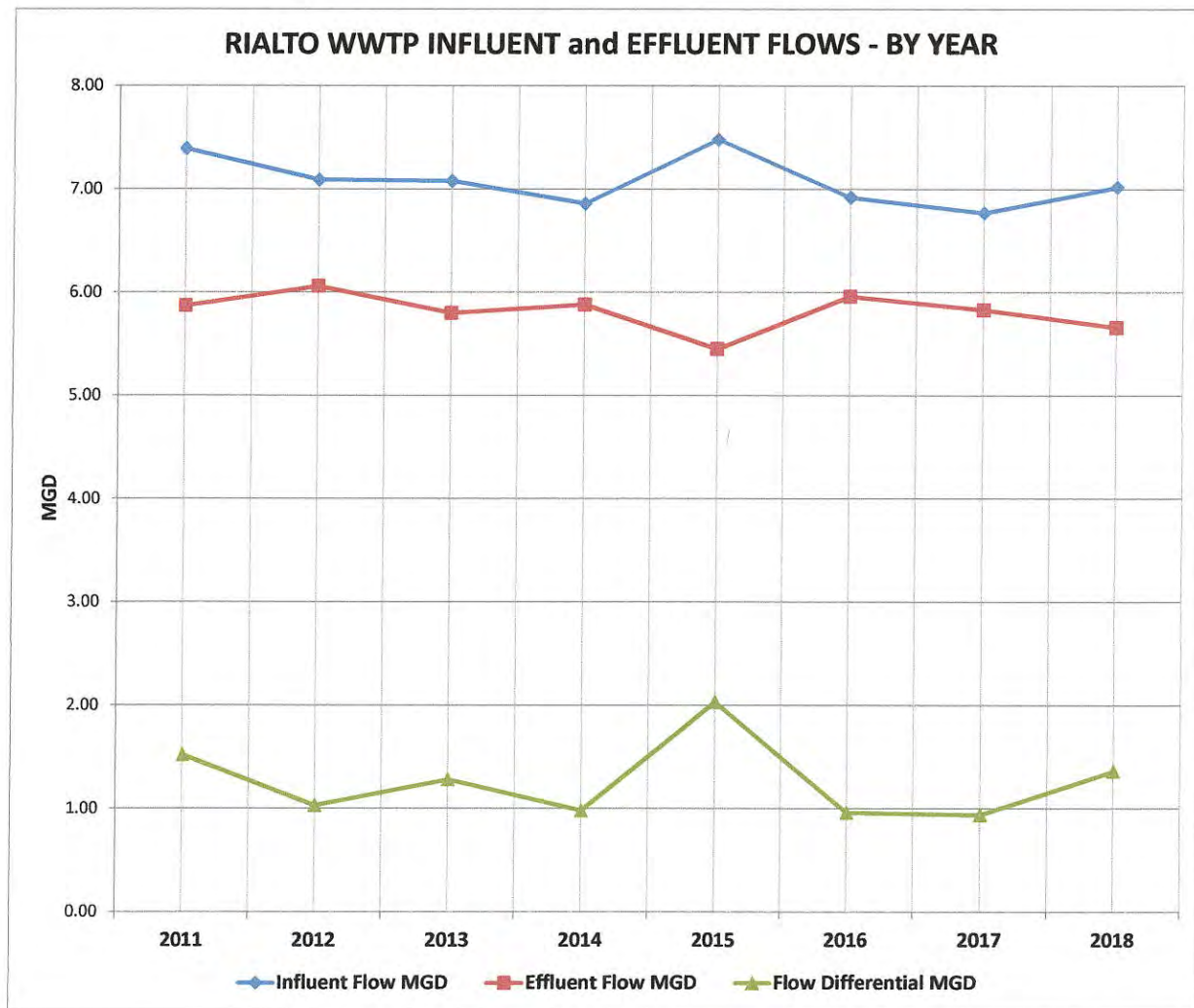
INFLUENT AND EFFLUENT FLOW DATA

MONTHLY INFLUENT AND EFFLUENT FLOWS			
Month	Influent Flow MGD	Effluent Flow MGD	Flow Differential MGD
January-18	6.89	5.56	1.33
February-18	6.94	5.42	1.52
March-18	6.65	5.56	1.09
April-18	6.72	5.61	1.11
May-18	6.75	5.52	1.24
June-18	6.89	5.41	1.48
July-18	7.18	5.65	1.53
August-18	7.63	5.76	1.88
September-18	6.92	5.71	1.21
October-18	7.04	5.65	1.38
November-18	7.10	5.64	1.46
December-18	7.52	6.36	1.17
<b>Average</b>	<b>7.02</b>	<b>5.66</b>	<b>1.37</b>





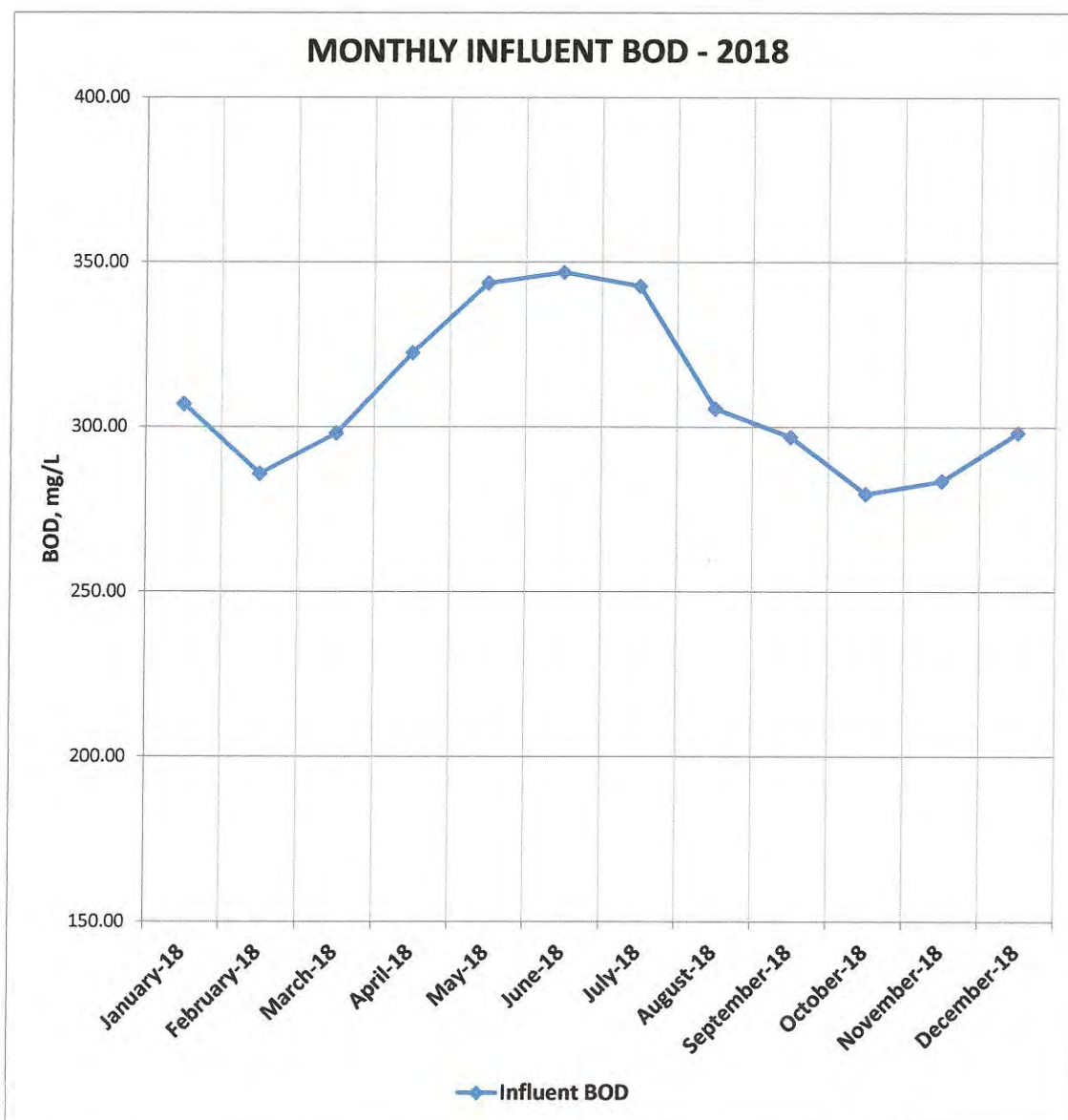
ANNUAL FLOWS			
Year	Influent Flow MGD	Effluent Flow MGD	Flow Differential MGD
2011	7.39	5.87	1.52
2012	7.09	6.06	1.03
2013	7.08	5.80	1.28
2014	6.86	5.88	0.98
2015	7.48	5.45	2.03
2016	6.92	5.96	0.96
2017	6.77	5.83	0.94
2018	7.02	5.66	1.36
Average	7.08	5.81	1.26



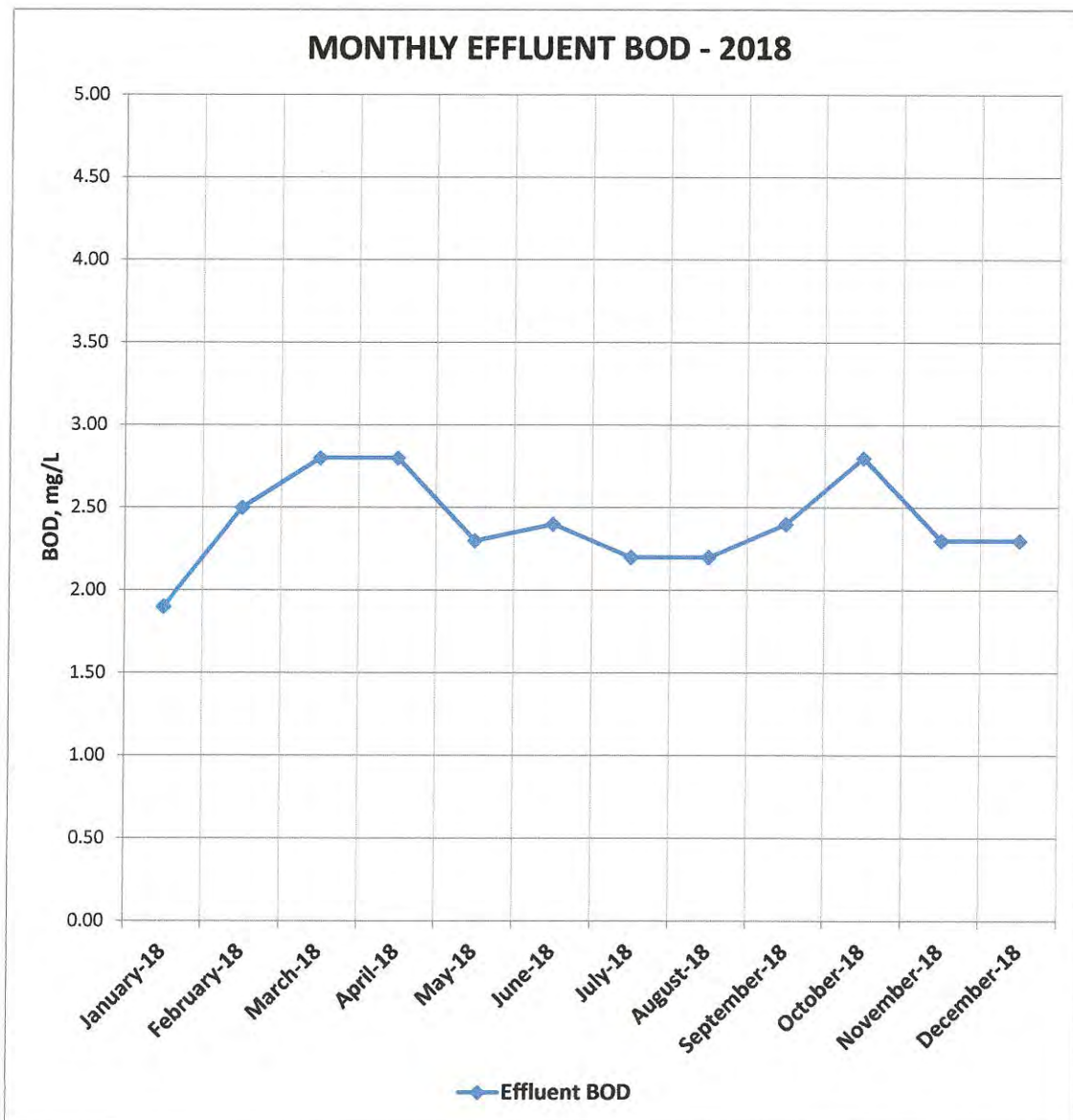
## APPENDIX B

### INFLUENT AND EFFLUENT BIOCHEMICAL OXYGEN DEMAND (BOD) DATA

MONTHLY INFLUENT BOD	
Month	Influent BOD mg/L
January-18	306.95
February-18	285.80
March-18	298.10
April-18	322.56
May-18	343.74
June-18	346.95
July-18	342.76
August-18	305.55
September-18	296.95
October-18	279.65
November-18	283.64
December-18	298.31
<b>Average</b>	<b>309.25</b>

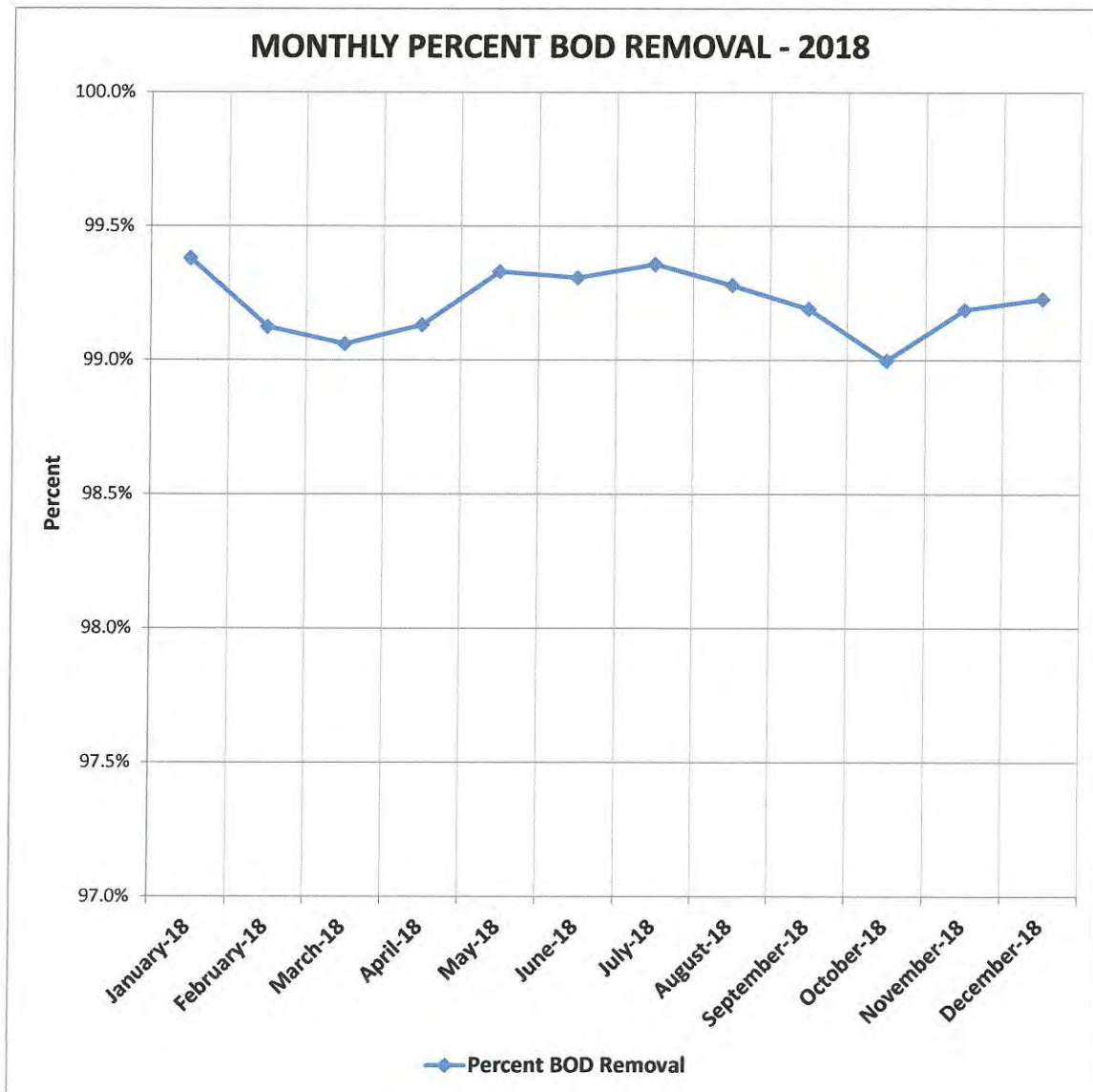


MONTHLY EFFLUENT BOD	
Month	Effluent BOD mg/L
January-18	1.90
February-18	2.50
March-18	2.80
April-18	2.80
May-18	2.30
June-18	2.40
July-18	2.20
August-18	2.20
September-18	2.40
October-18	2.80
November-18	2.30
December-18	2.30
<b>Average</b>	<b>2.41</b>

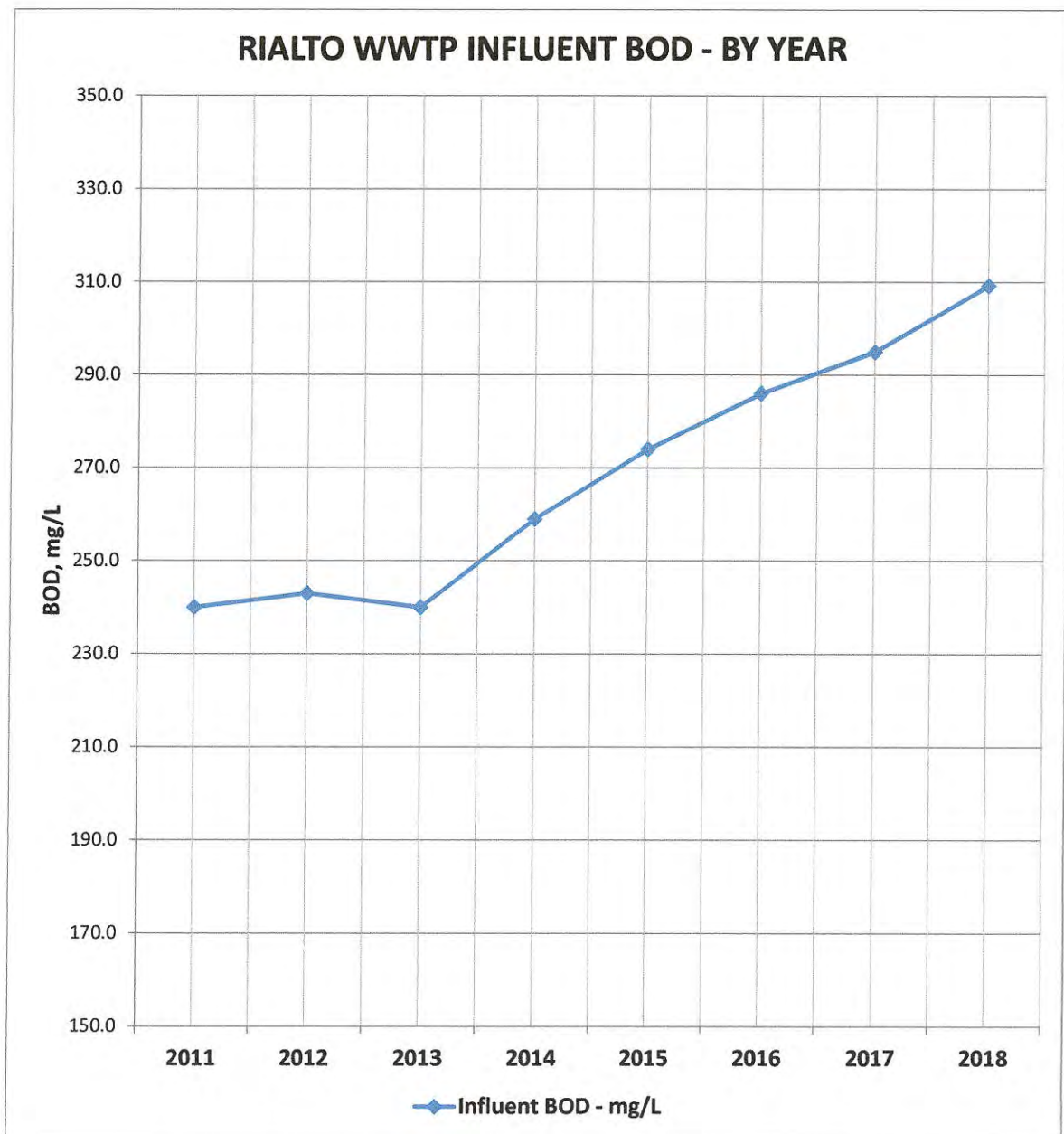




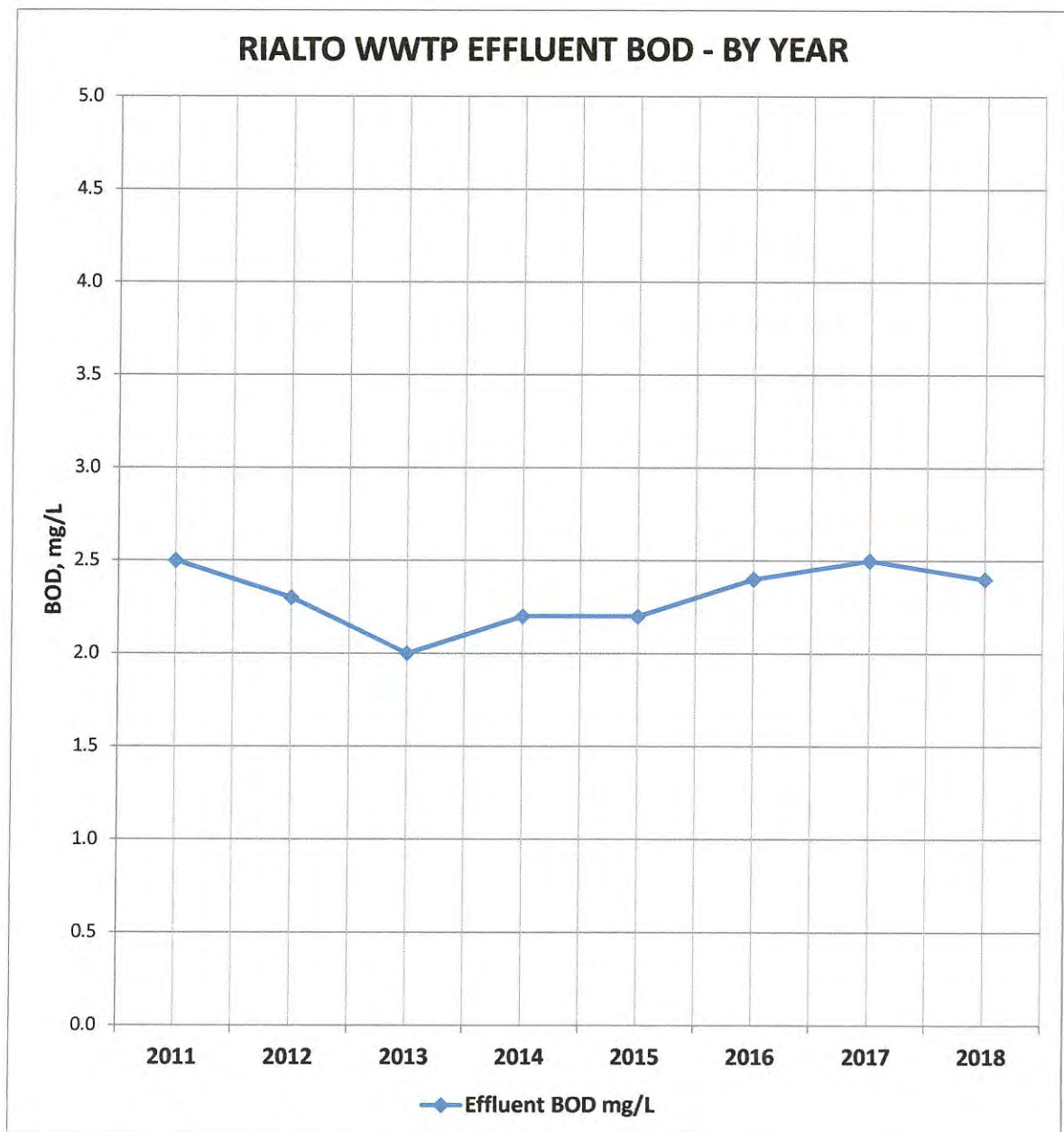
MONTHLY PERCENT BOD REMOVAL	
Month	Percent BOD Removal
January-18	99.4%
February-18	99.1%
March-18	99.1%
April-18	99.1%
May-18	99.3%
June-18	99.3%
July-18	99.4%
August-18	99.3%
September-18	99.2%
October-18	99.0%
November-18	99.2%
December-18	99.2%
<b>Average</b>	<b>99.2%</b>



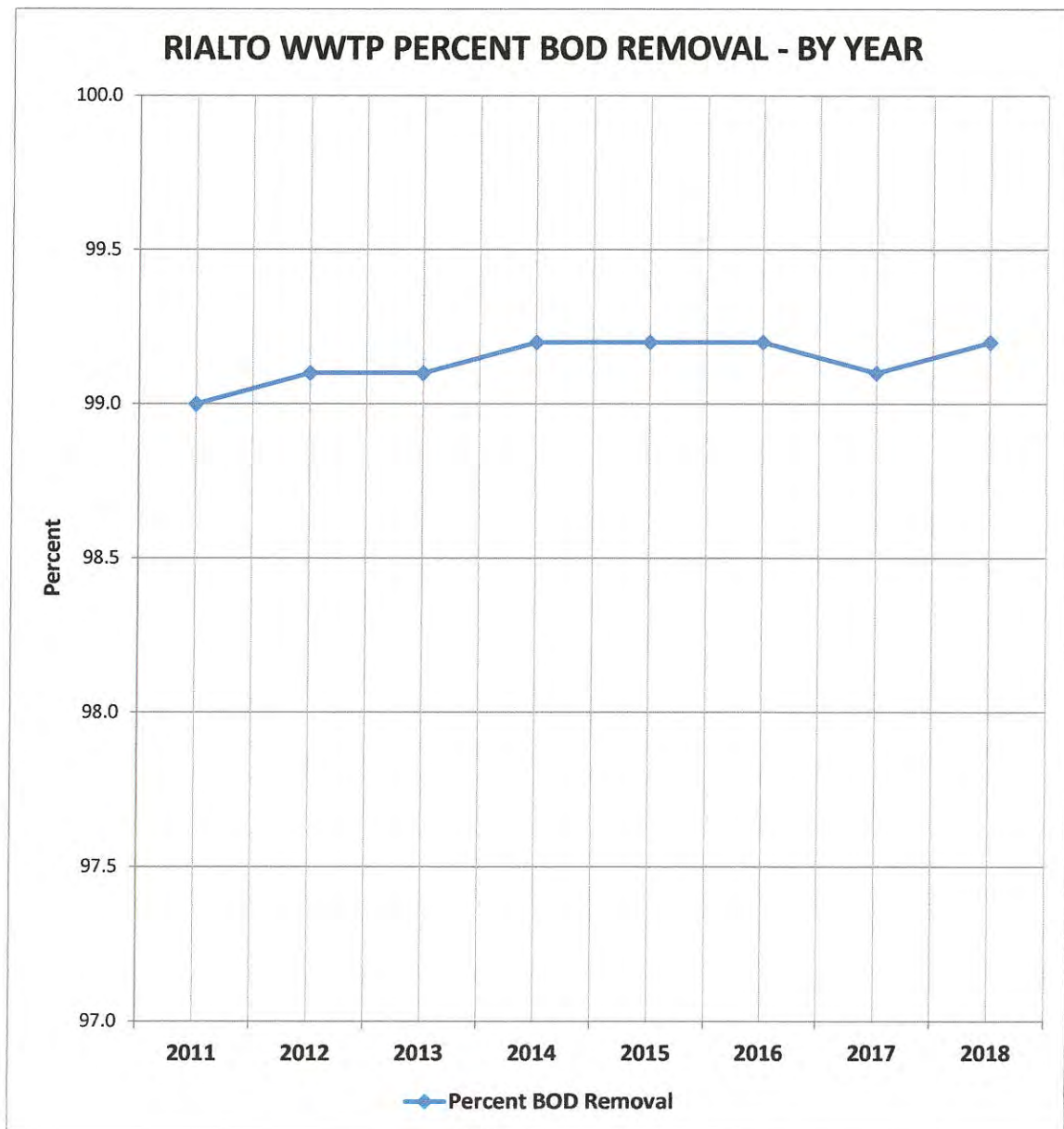
ANNUAL INFLUENT BOD	
Year	Influent BOD mg/L
2011	240.0
2012	243.0
2013	240.0
2014	259.0
2015	274.0
2016	286.0
2017	295.0
2018	309.3
Average	268.3



ANNUAL EFFLUENT BOD	
Year	Effluent BOD mg/L
2011	2.5
2012	2.3
2013	2.0
2014	2.2
2015	2.2
2016	2.4
2017	2.5
2018	2.4
<b>Average</b>	<b>2.3</b>



ANNUAL PERCENT BOD REMOVAL	
Year	Percent BOD Removal
2011	99.0
2012	99.1
2013	99.1
2014	99.2
2015	99.2
2016	99.2
2017	99.1
2018	99.2
Average	99.1

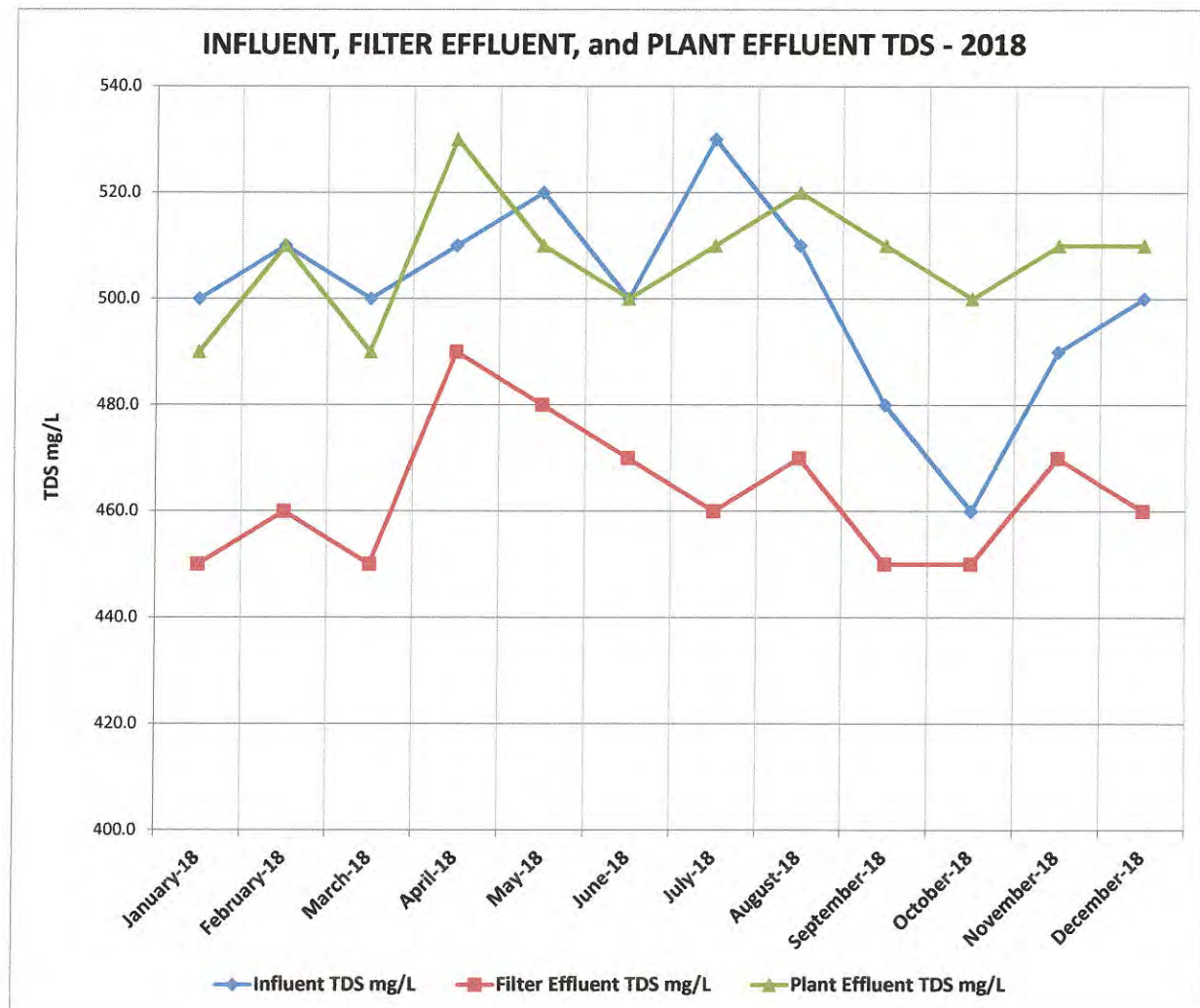




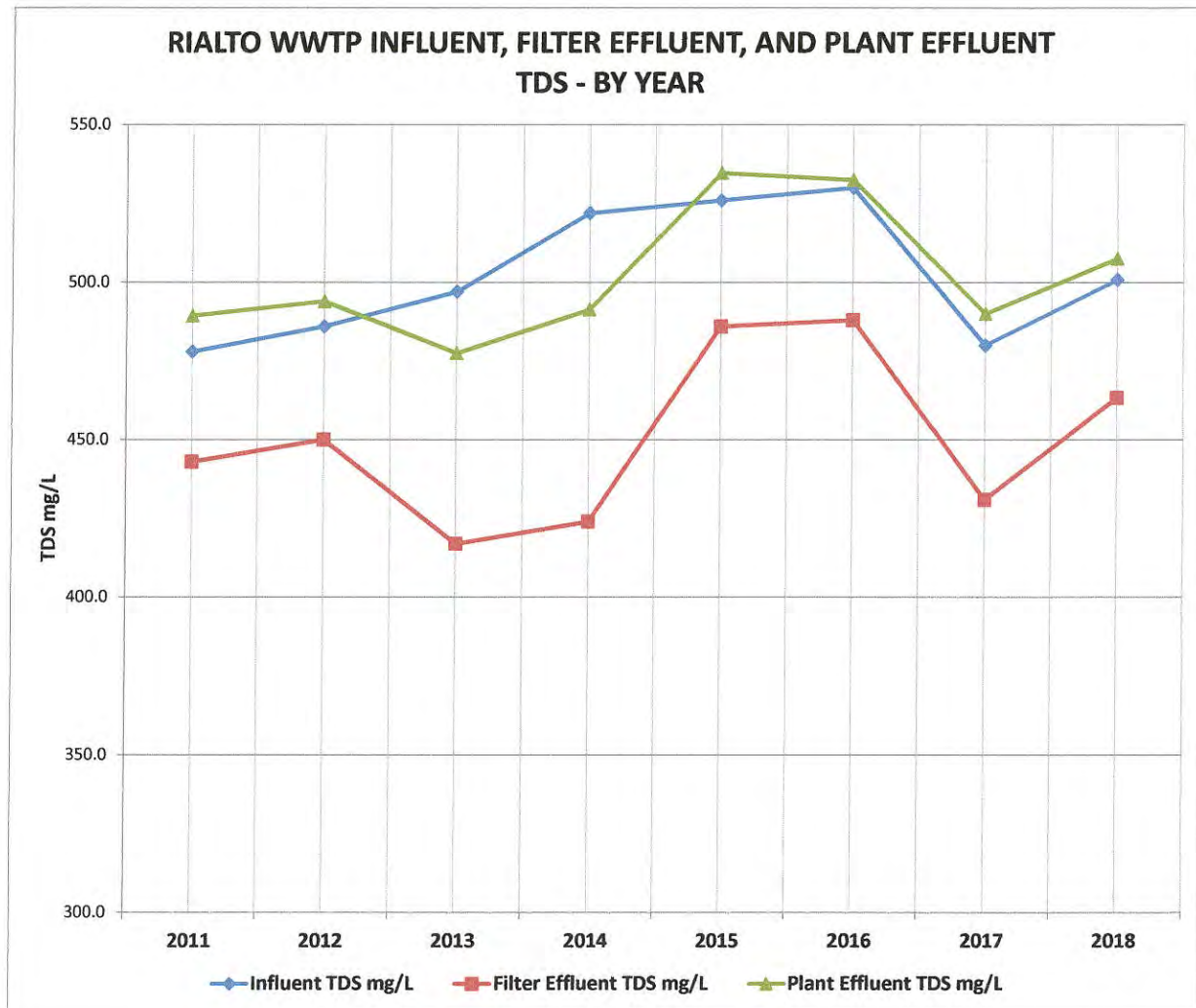
## APPENDIX C

### INFLUENT AND EFFLUENT TOTAL DISSOLVED SOLIDS (TDS) DATA

MONTHLY INFLUENT AND EFFLUENT TOTAL DISSOLVED SOLIDS (TDS)			
Month	Influent TDS mg/L	Filter Effluent TDS mg/L	Plant Effluent TDS mg/L
January-18	500.0	450.0	490.0
February-18	510.0	460.0	510.0
March-18	500.0	450.0	490.0
April-18	510.0	480.0	530.0
May-18	520.0	480.0	510.0
June-18	500.0	470.0	500.0
July-18	530.0	460.0	510.0
August-18	510.0	470.0	520.0
September-18	480.0	450.0	510.0
October-18	460.0	450.0	500.0
November-18	490.0	470.0	510.0
December-18	500.0	460.0	510.0
<b>Average</b>	<b>500.8</b>	<b>463.3</b>	<b>507.5</b>



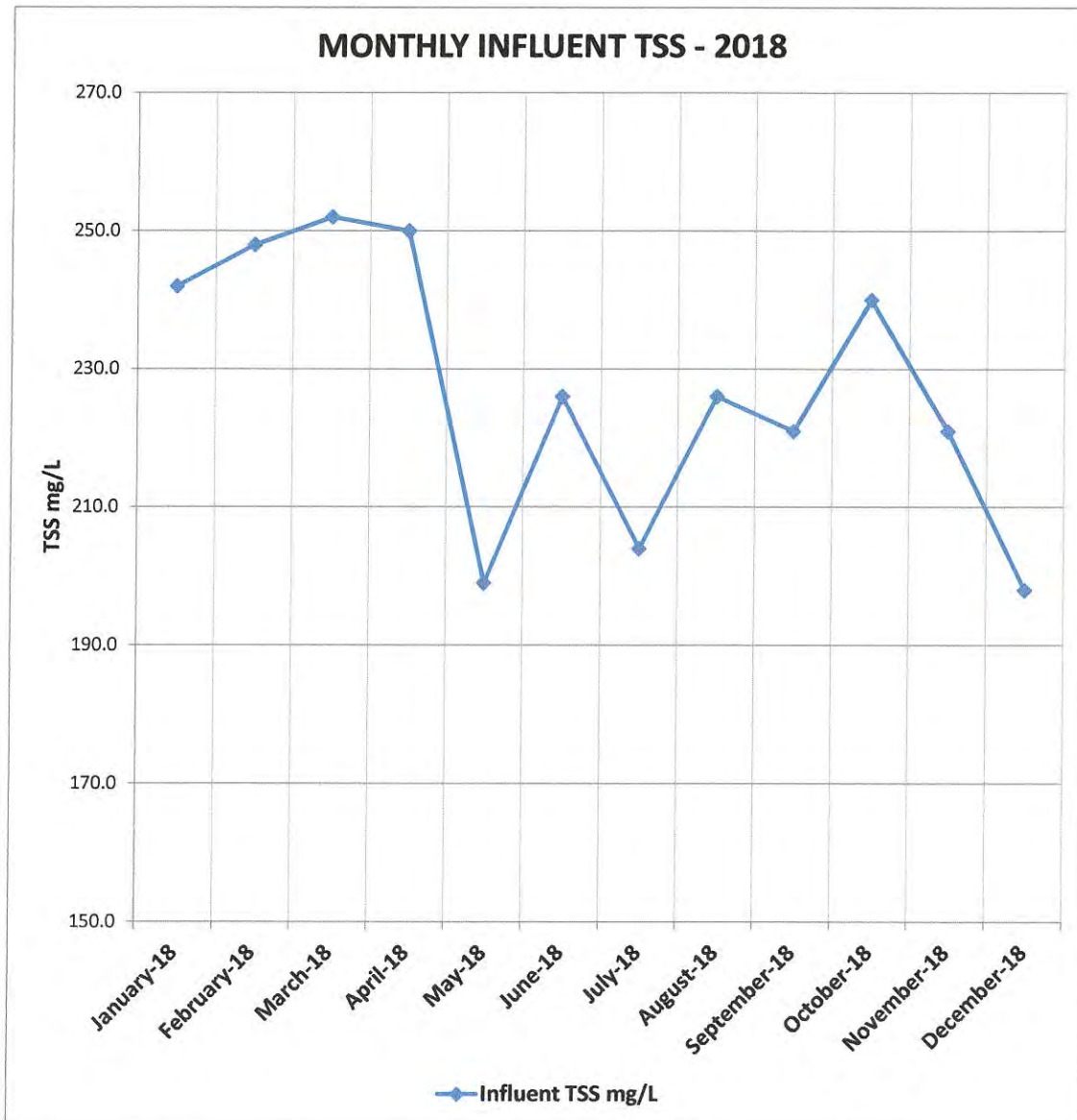
ANNUAL TOTAL DISSOLVED SOLIDS (TDS)			
Year	Influent TDS mg/L	Filter Effluent TDS mg/L	Plant Effluent TDS mg/L
2011	478.0	443.0	489.4
2012	486.0	450.0	493.9
2013	497.0	417.0	477.5
2014	522.0	424.0	491.3
2015	526.0	486.0	534.7
2016	530.0	488.0	532.5
2017	480.0	431.0	490.0
2018	500.8	463.3	507.5
Average	502.5	450.3	502.1



## APPENDIX D

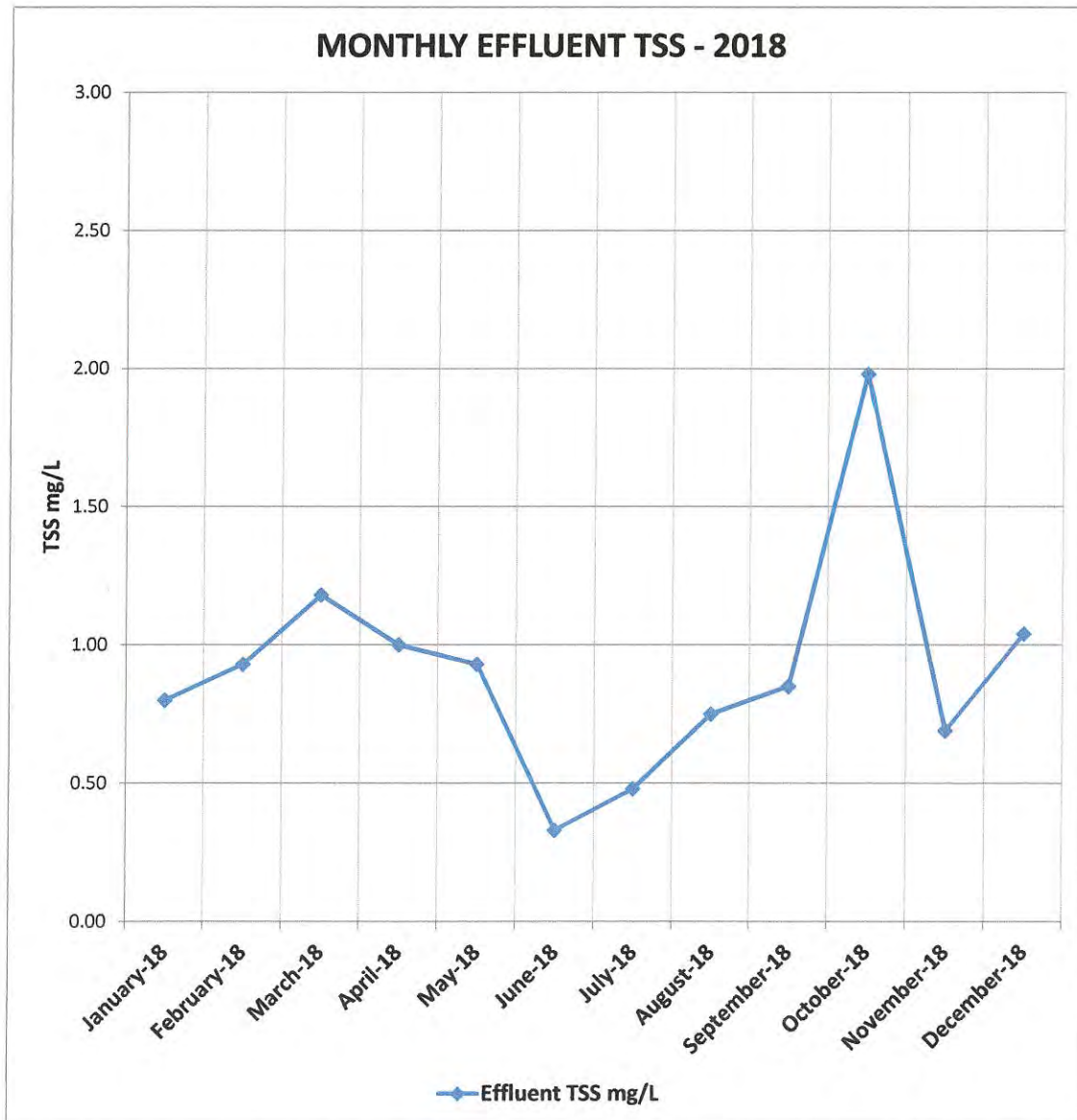
### INFLUENT AND EFFLUENT TOTAL SUSPENDED SOLIDS (TSS) DATA

MONTHLY INFLUENT TSS	
Month	Influent TSS mg/L
January-18	242.0
February-18	248.0
March-18	252.0
April-18	250.0
May-18	199.0
June-18	226.0
July-18	204.0
August-18	226.0
September-18	221.0
October-18	240.0
November-18	221.0
December-18	198.0
<b>Average</b>	<b>227.3</b>

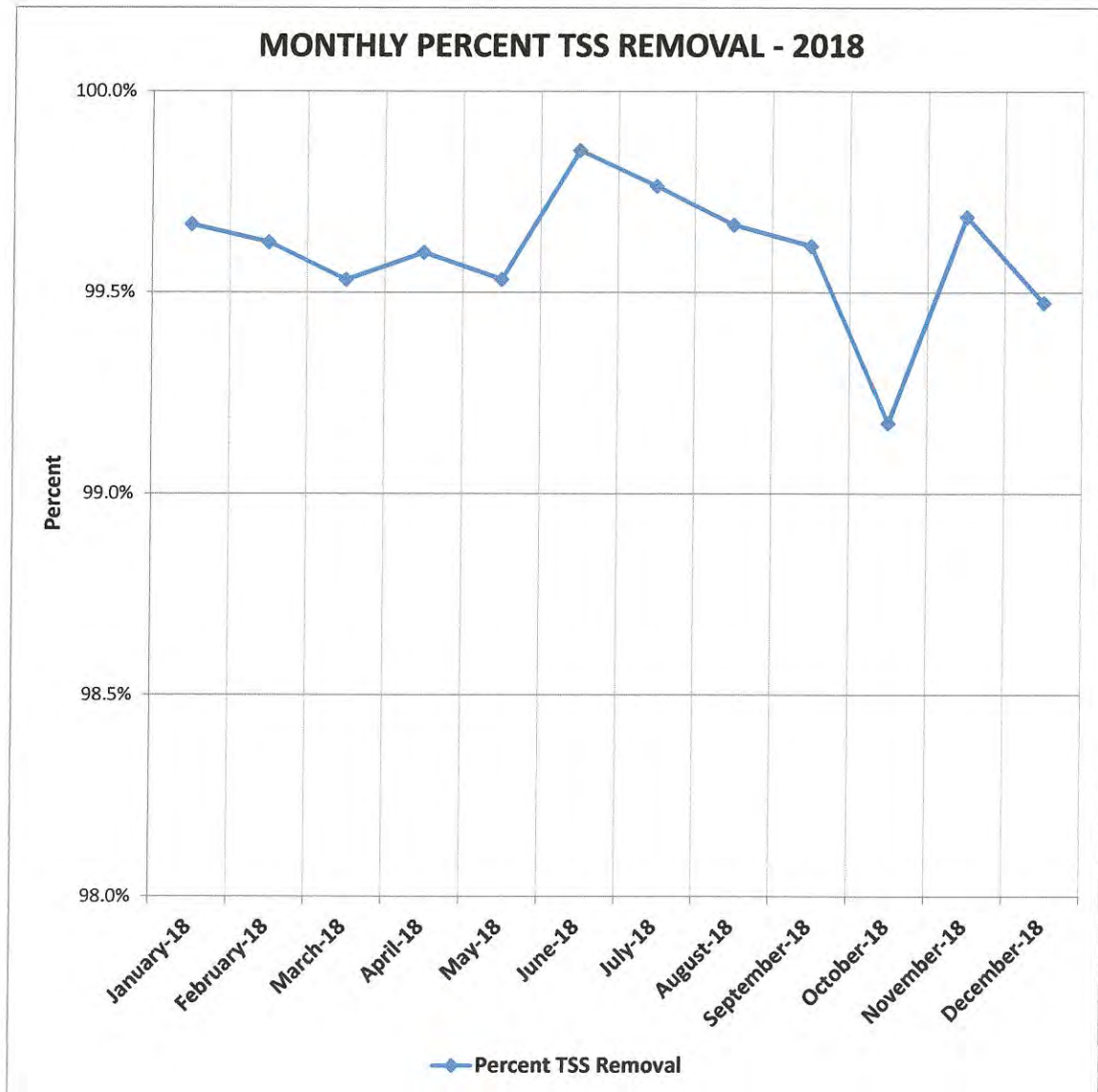




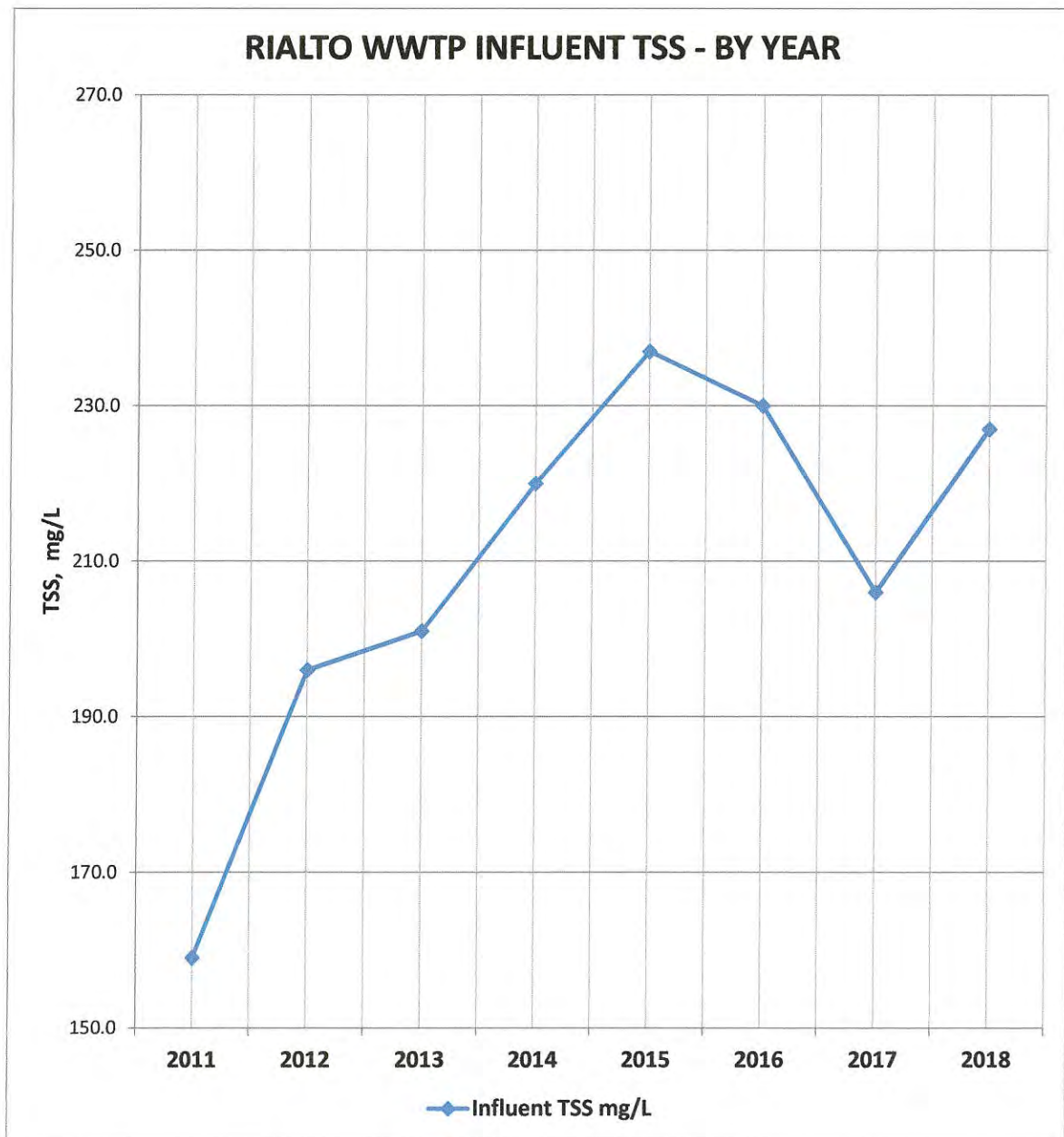
MONTHLY EFFLUENT TSS	
Month	Effluent TSS mg/L
January-18	0.80
February-18	0.93
March-18	1.18
April-18	1.00
May-18	0.93
June-18	0.33
July-18	0.48
August-18	0.75
September-18	0.85
October-18	1.98
November-18	0.69
December-18	1.04
<b>Average</b>	<b>0.91</b>



MONTHLY PERCENT TSS REMOVAL	
Month	Percent TSS Removal
January-18	99.7%
February-18	99.6%
March-18	99.5%
April-18	99.6%
May-18	99.5%
June-18	99.9%
July-18	99.8%
August-18	99.7%
September-18	99.6%
October-18	99.2%
November-18	99.7%
December-18	99.5%
<b>Average</b>	<b>99.6%</b>

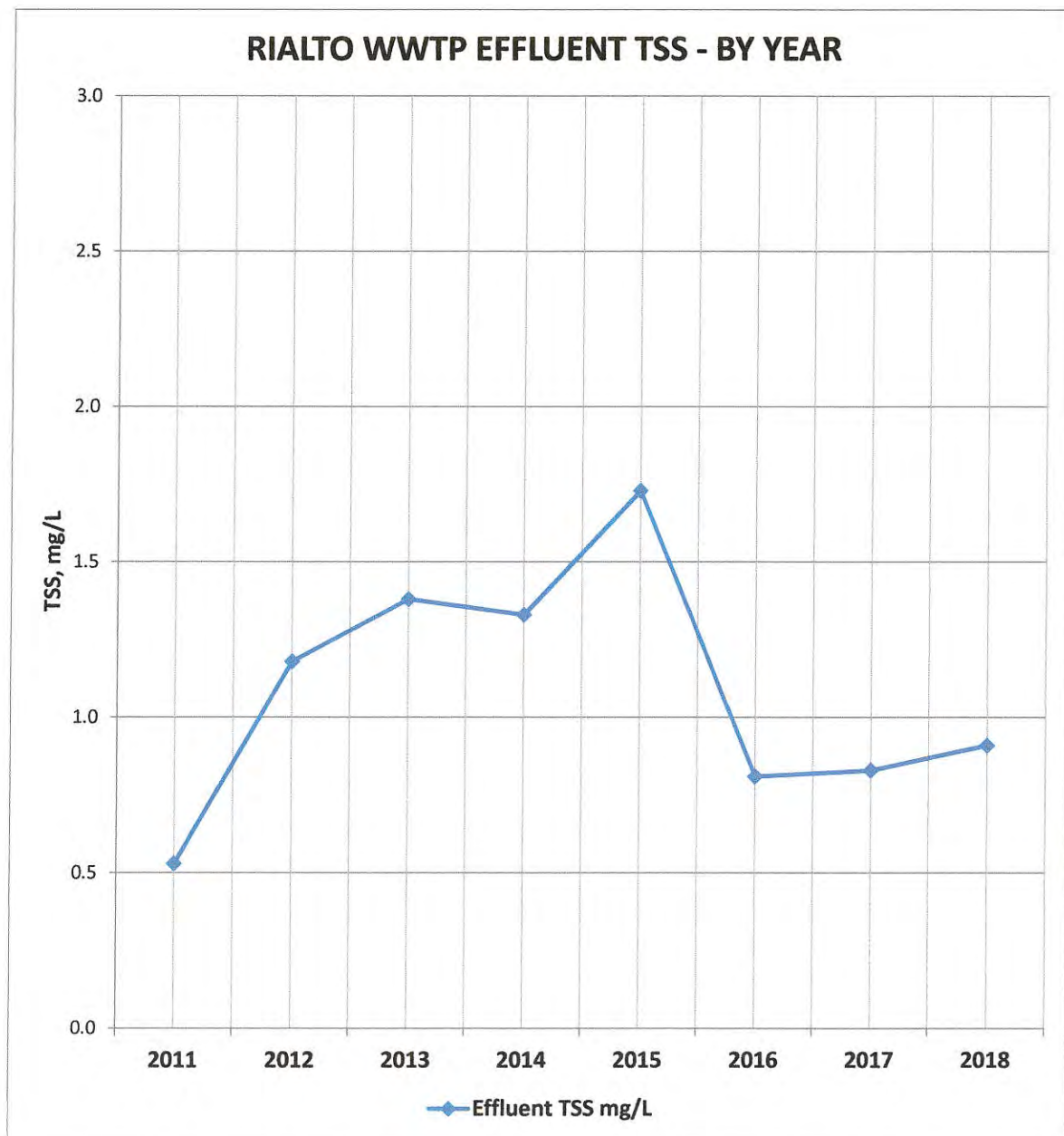


ANNUAL INFLUENT TSS	
Year	Influent TSS mg/L
2011	159.0
2012	196.0
2013	201.0
2014	220.0
2015	237.0
2016	230.0
2017	206.0
2018	227.0
Average	209.5

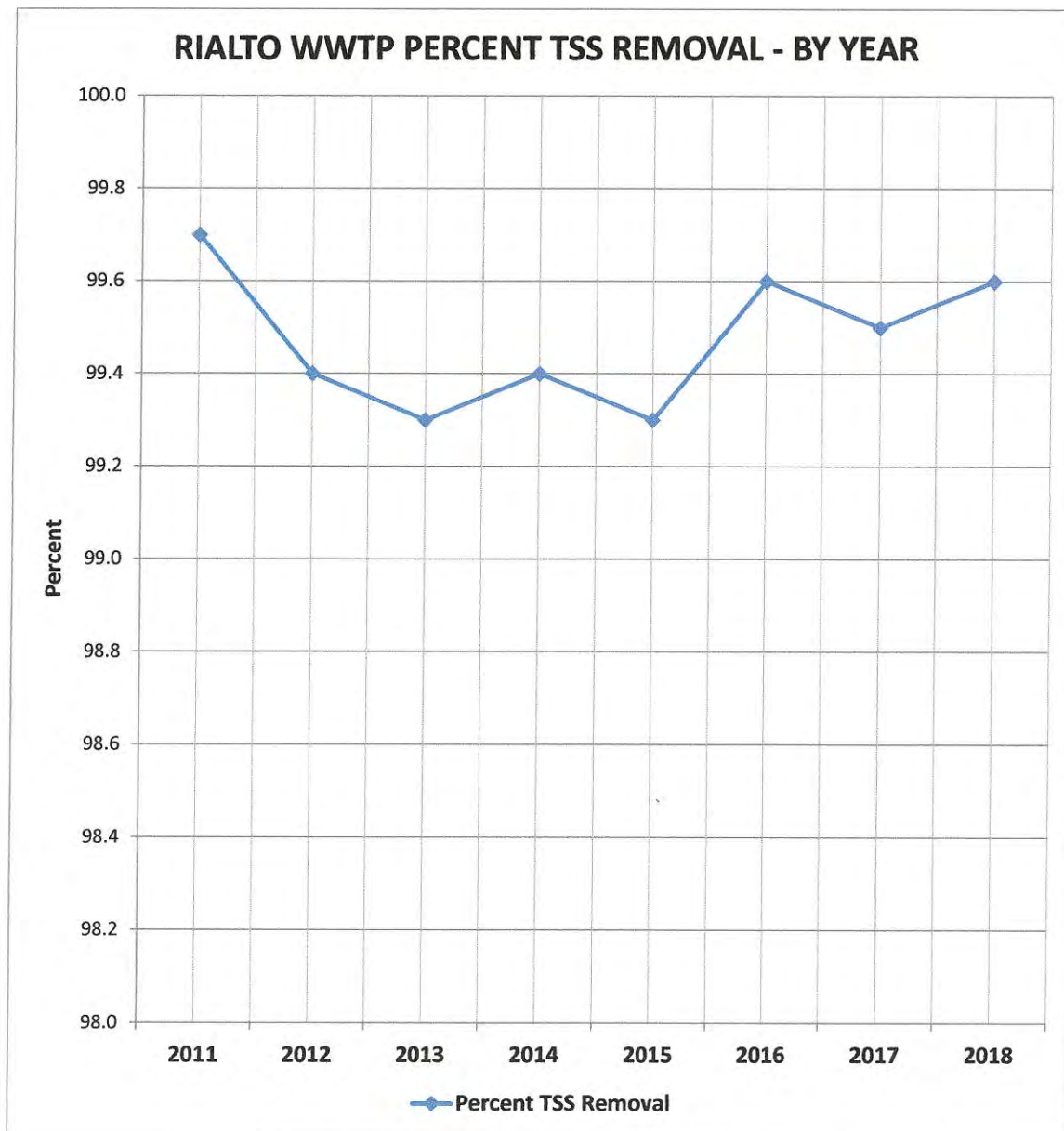




ANNUAL EFFLUENT TSS	
Year	Effluent TSS mg/L
2011	0.5
2012	1.2
2013	1.4
2014	1.3
2015	1.7
2016	0.8
2017	0.8
2018	0.9
Average	1.1



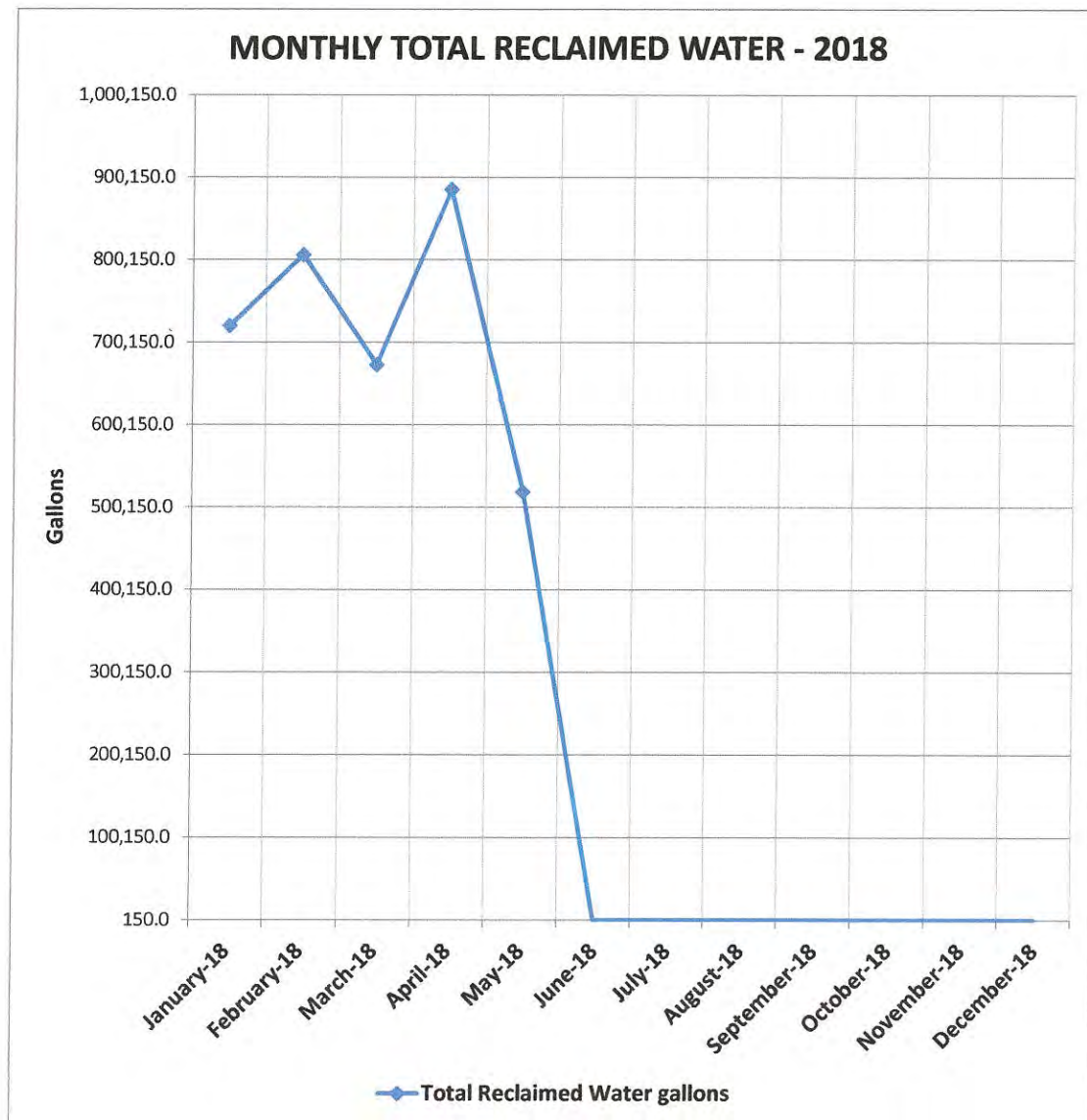
ANNUAL PERCENT TSS REMOVAL	
Year	Percent TSS Removal
2011	99.7
2012	99.4
2013	99.3
2014	99.4
2015	99.3
2016	99.6
2017	99.5
2018	99.6
Average	99.5



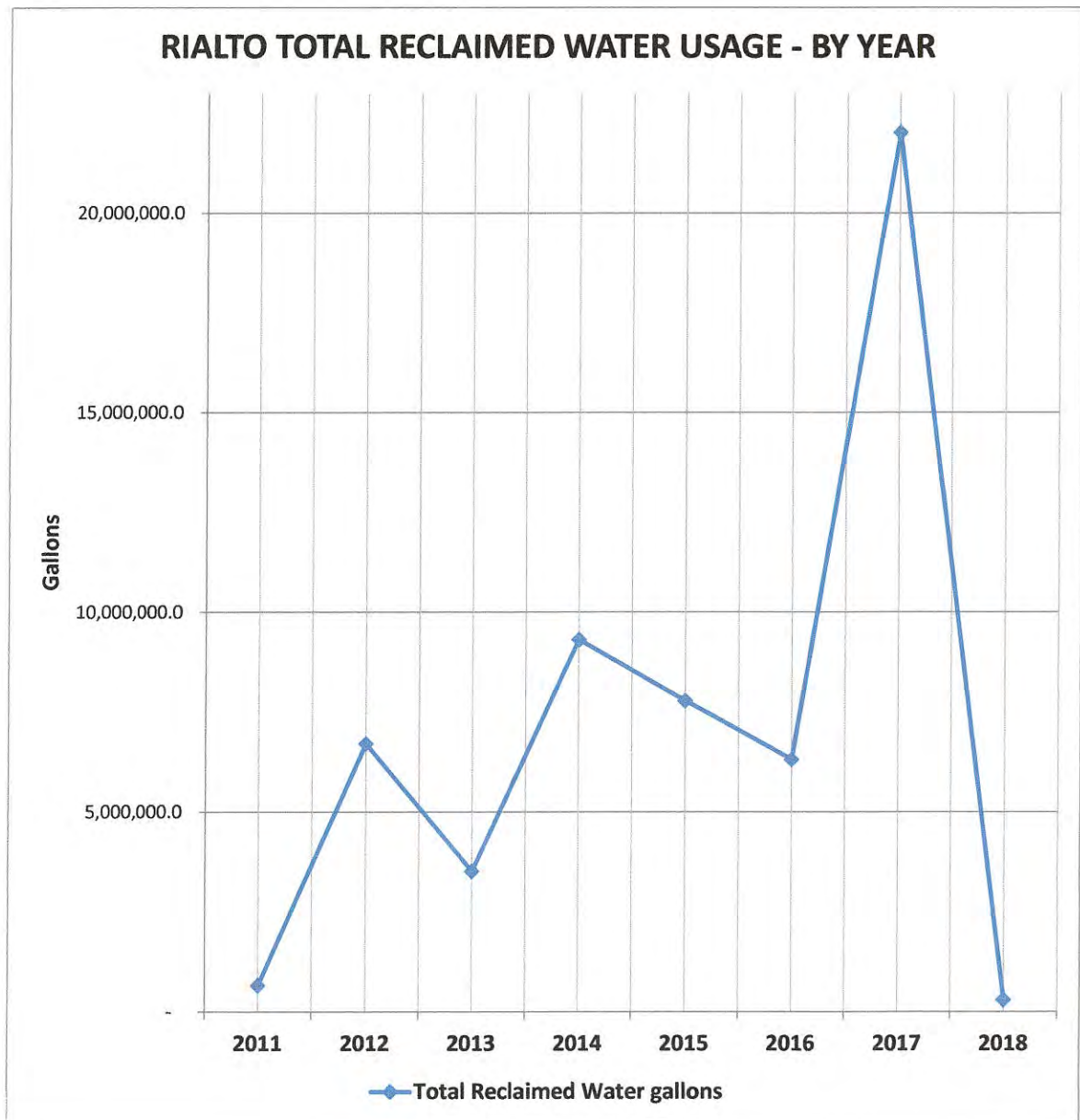
APPENDIX E

RECLAIMED WATER DATA

MONTHLY TOTAL RECLAIMED WATER	
Month	Total Reclaimed Water gallons
January-18	720,324.0
February-18	806,344.0
March-18	673,200.0
April-18	885,632.0
May-18	519,112.0
June-18	0.0
July-18	0.0
August-18	0.0
September-18	0.0
October-18	0.0
November-18	0.0
December-18	0.0
<b>Average</b>	<b>300,384.3</b>



ANNUAL RECLAIMED WATER USAGE	
Year	Total Reclaimed Water gallons
2011	658,219.0
2012	6,709,272.0
2013	3,515,932.0
2014	9,316,080.0
2015	7,778,063.0
2016	6,311,734.0
2017	22,021,868.0
2018	300,384.3
Average	7,076,444.0

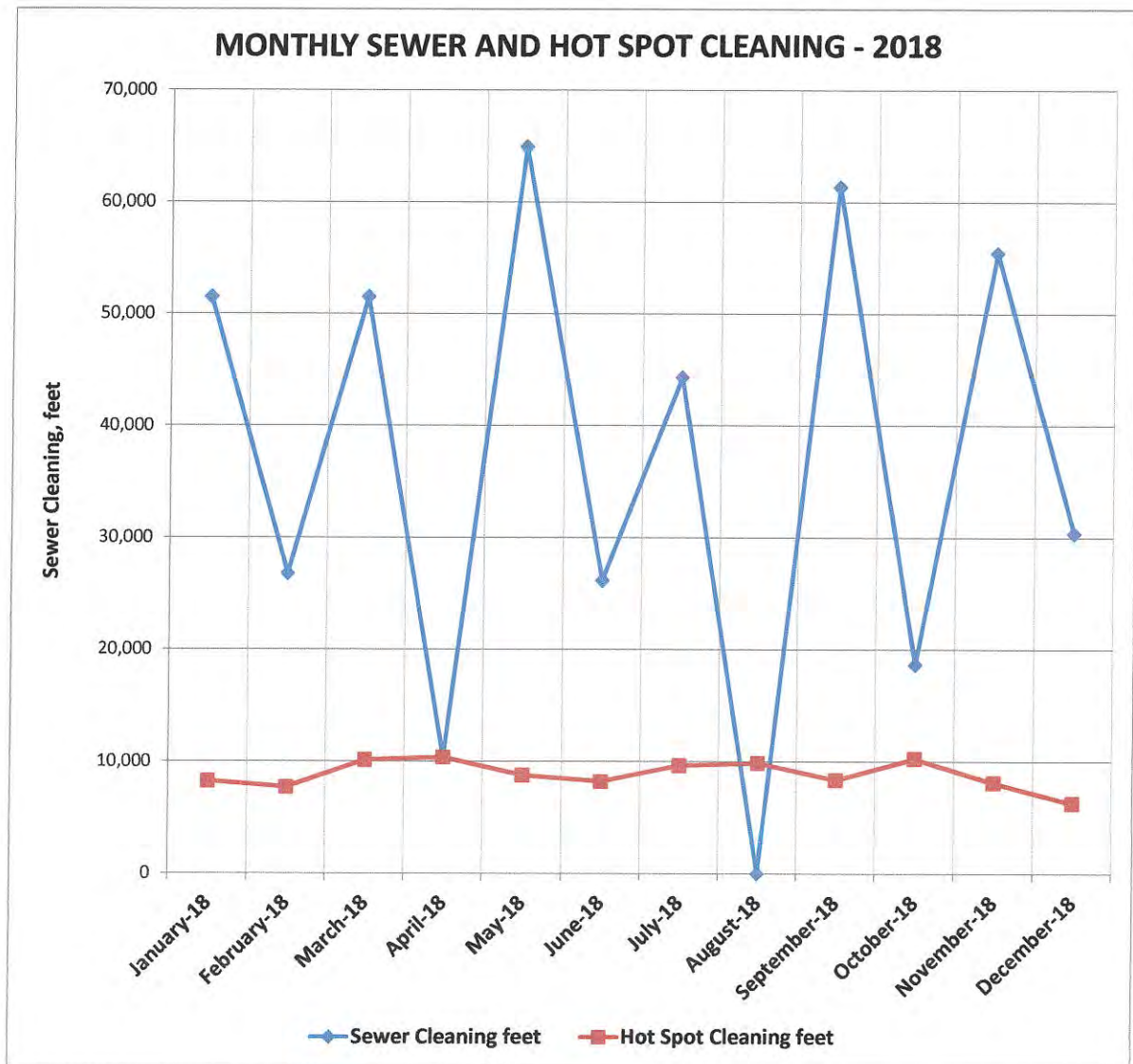




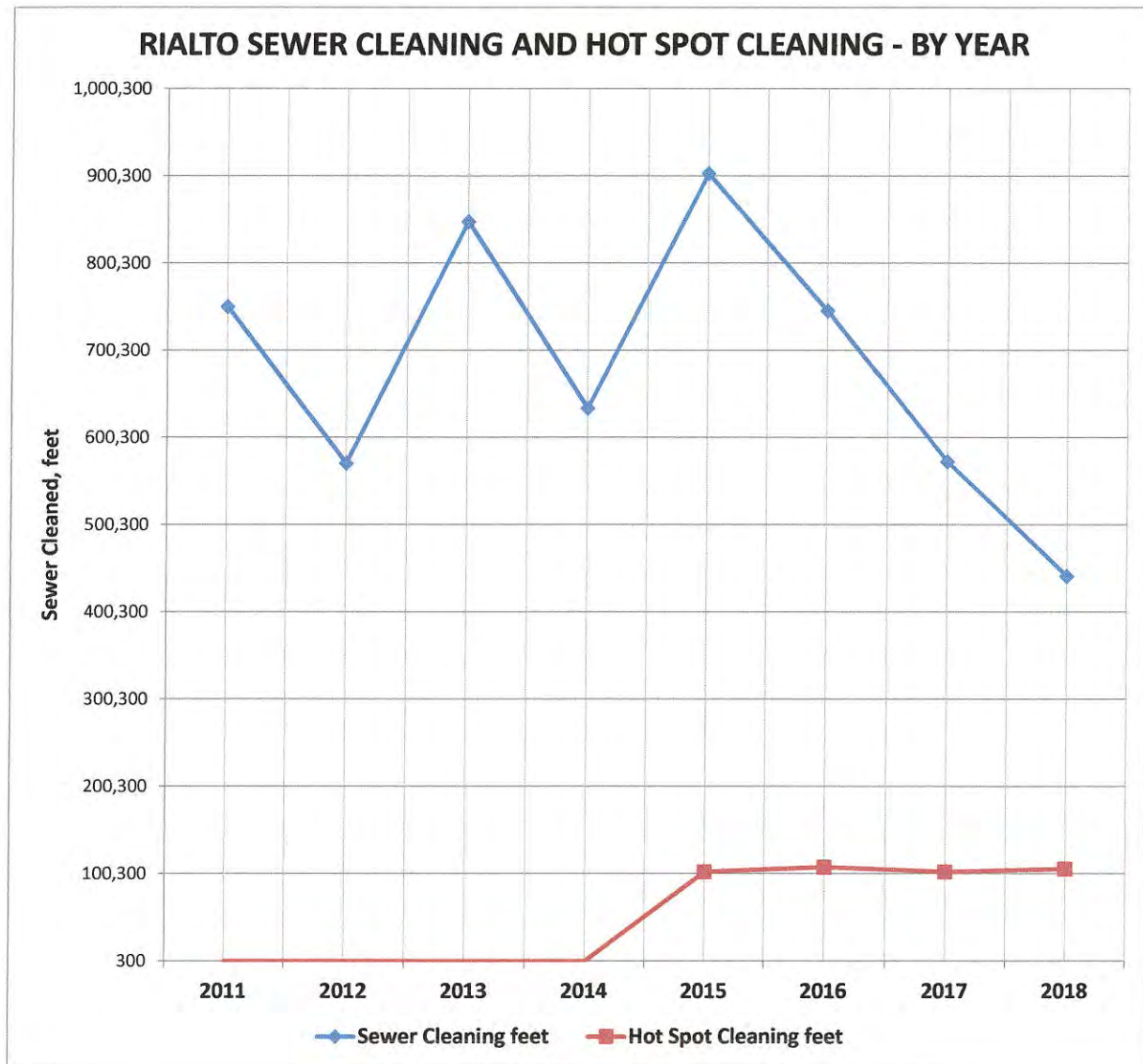
APPENDIX F

SEWER CLEANING AND TELEVISIONING  
DATA

MONTHLY SEWER AND 'HOT SPOT' CLEANING		
Month	Sewer Cleaning feet	Hot Spot Cleaning feet
January-18	51,532	8,263
February-18	26,799	7,708
March-18	51,527	10,149
April-18	10,384	10,384
May-18	64,947	8,782
June-18	26,174	8,225
July-18	44,321	9,657
August-18	0	9,883
September-18	61,353	8,375
October-18	18,676	10,262
November-18	55,438	8,113
December-18	30,381	6,289
<b>Average</b>	<b>36,794</b>	<b>8,841</b>
<b>Total</b>	<b>441,532</b>	<b>106,090</b>



ANNUAL SEWER CLEANING		
Year	Sewer Cleaning feet	Hot Spot Cleaning feet
2011	750,561	N/A
2012	571,008	N/A
2013	847,969	N/A
2014	634,004	N/A
2015	903,294	102,476
2016	745,616	107,925
2017	572,833	102,447
2018	441,532	106,090
Average	683,352	104,735

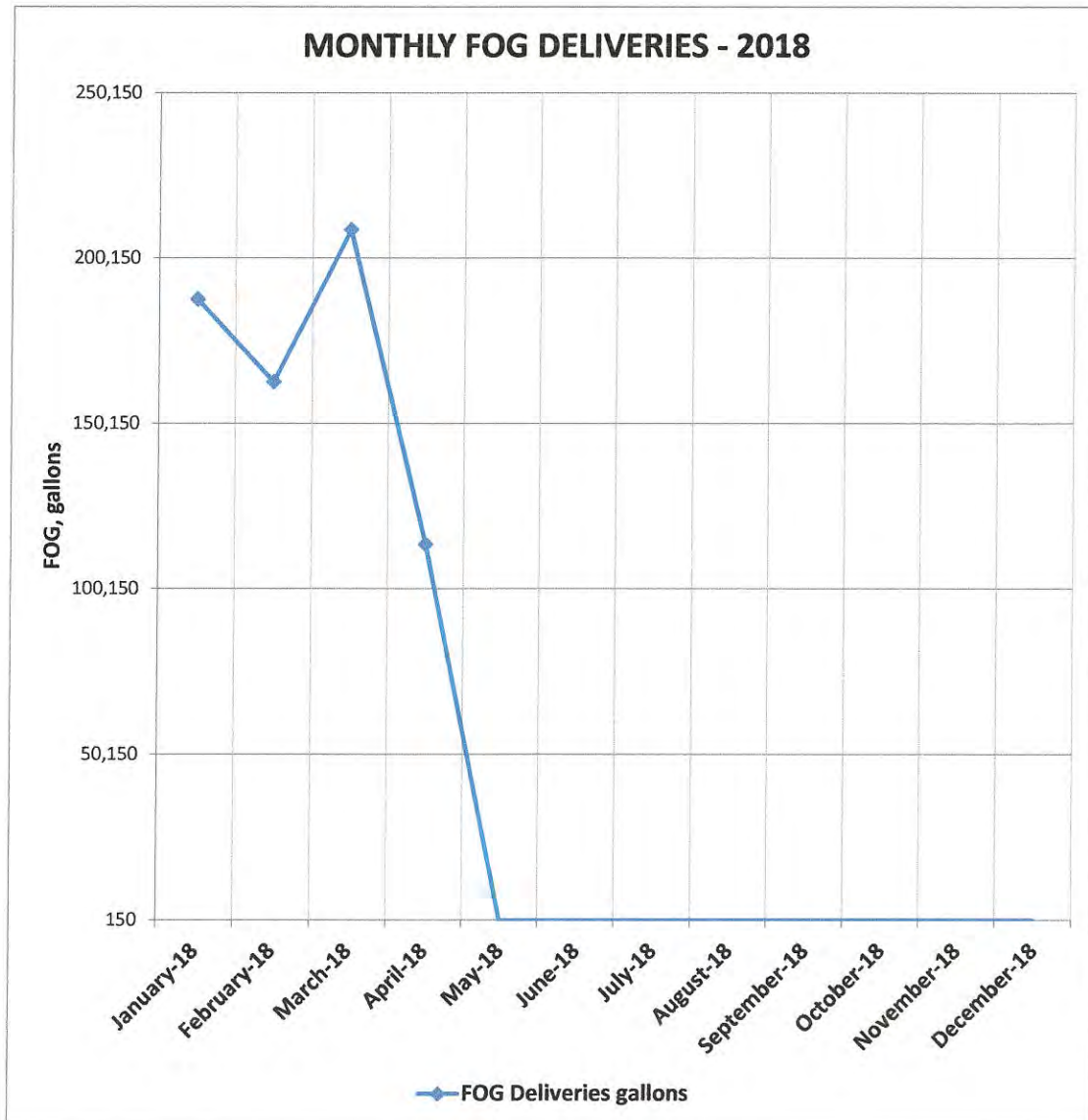




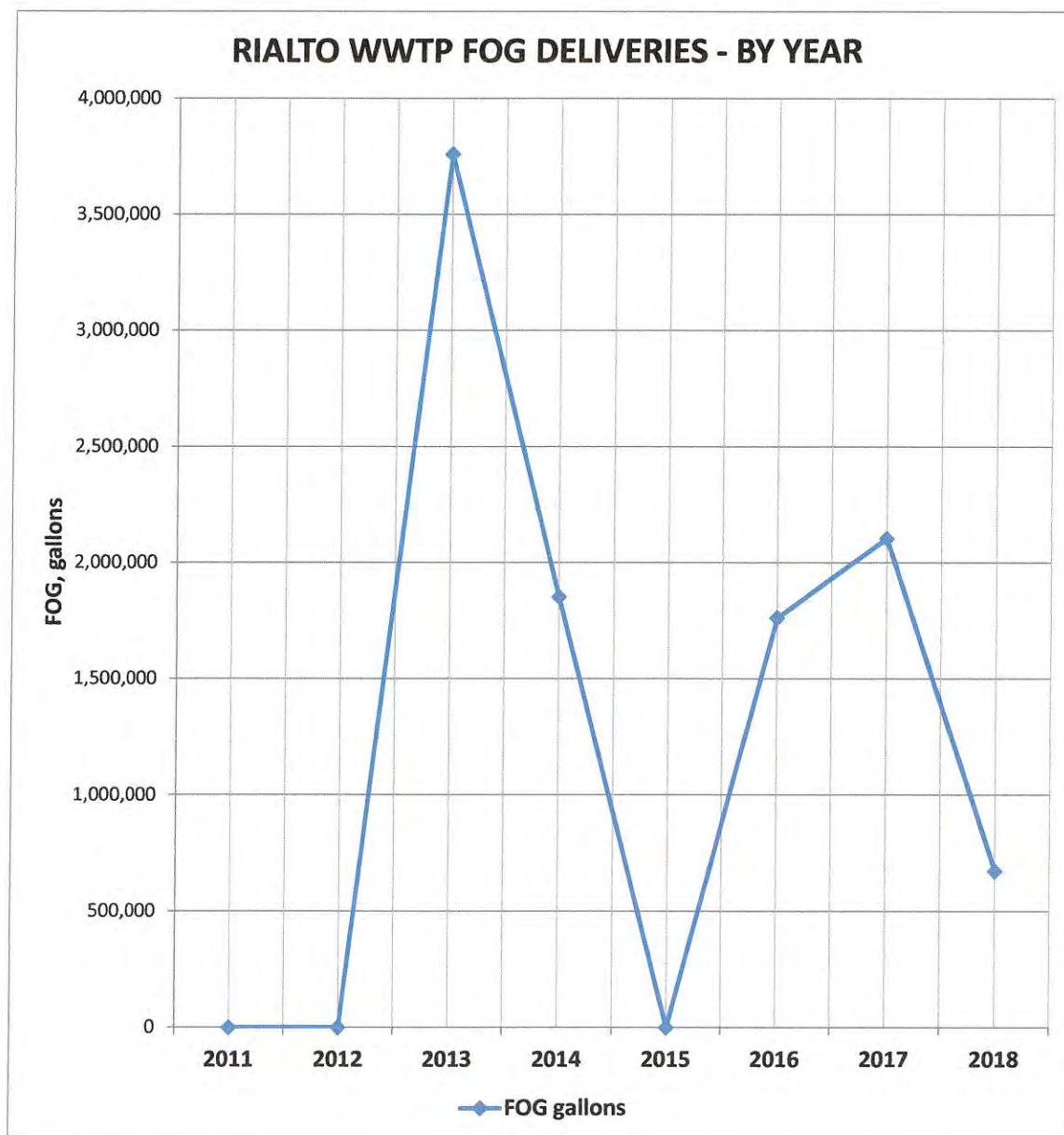
## APPENDIX G

### FATS OILS AND GREASE (FOG) DATA

MONTHLY FOG DELIVERIES	
Month	FOG Deliveries gallons
January-18	187,700
February-18	162,723
March-18	208,770
April-18	113,689
May-18	0
June-18	0
July-18	0
August-18	0
September-18	0
October-18	0
November-18	0
December-18	0
<b>Average</b>	<b>56,074</b>
<b>Total</b>	<b>672,882</b>



ANNUAL FOG DELIVERIES	
Year	FOG gallons
2011	N/A*
2012	N/A*
2013	3,759,225
2014	1,851,952
2015	746,078*
2016	1,761,950
2017	2,103,530
2018	672,882
Average	2,029,908

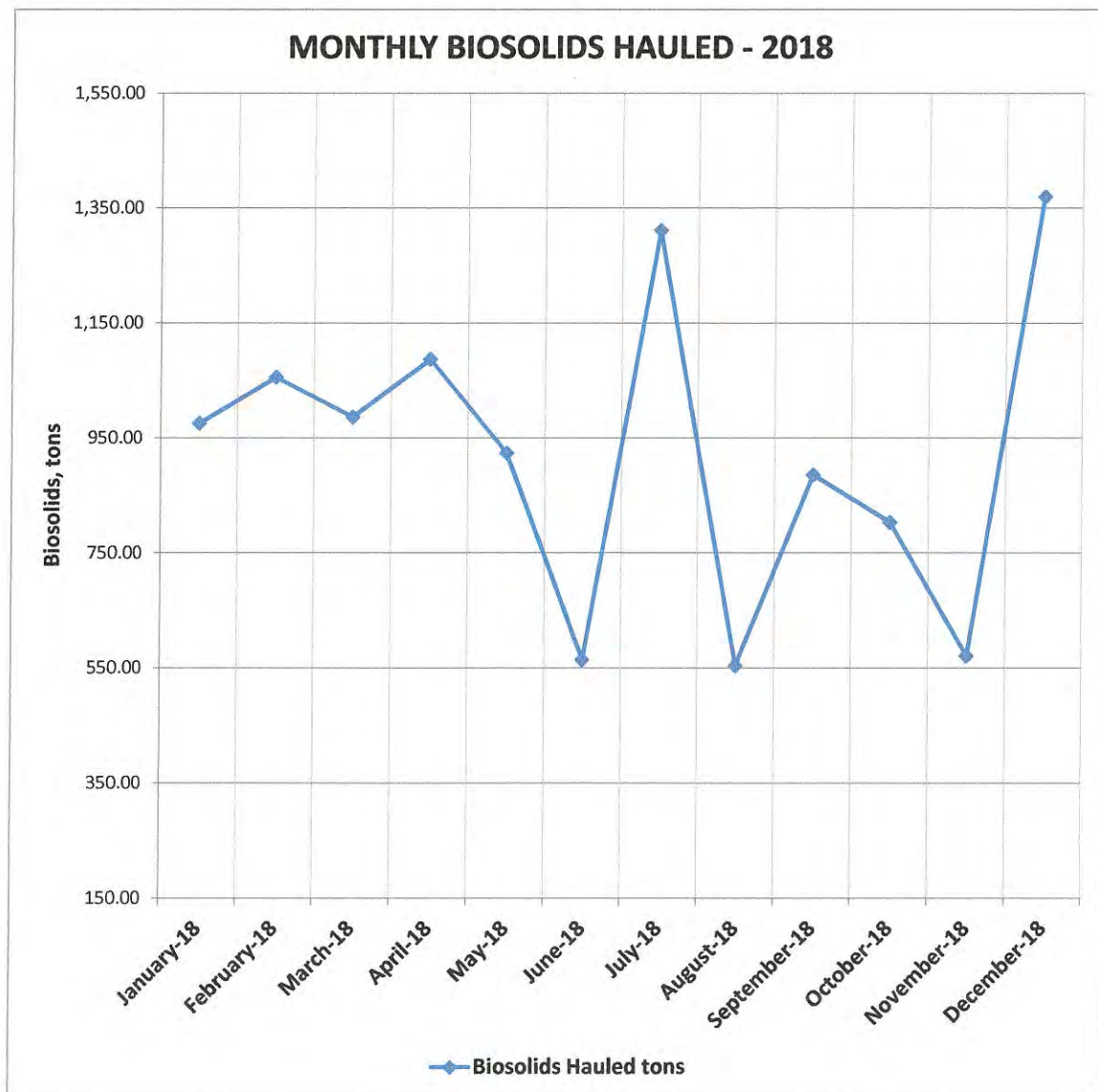


\* Recording of FOG deliveries commenced in February 2013. In November 2014, an explosion at the FOG control panel occurred that was repaired in August 2015

APPENDIX H

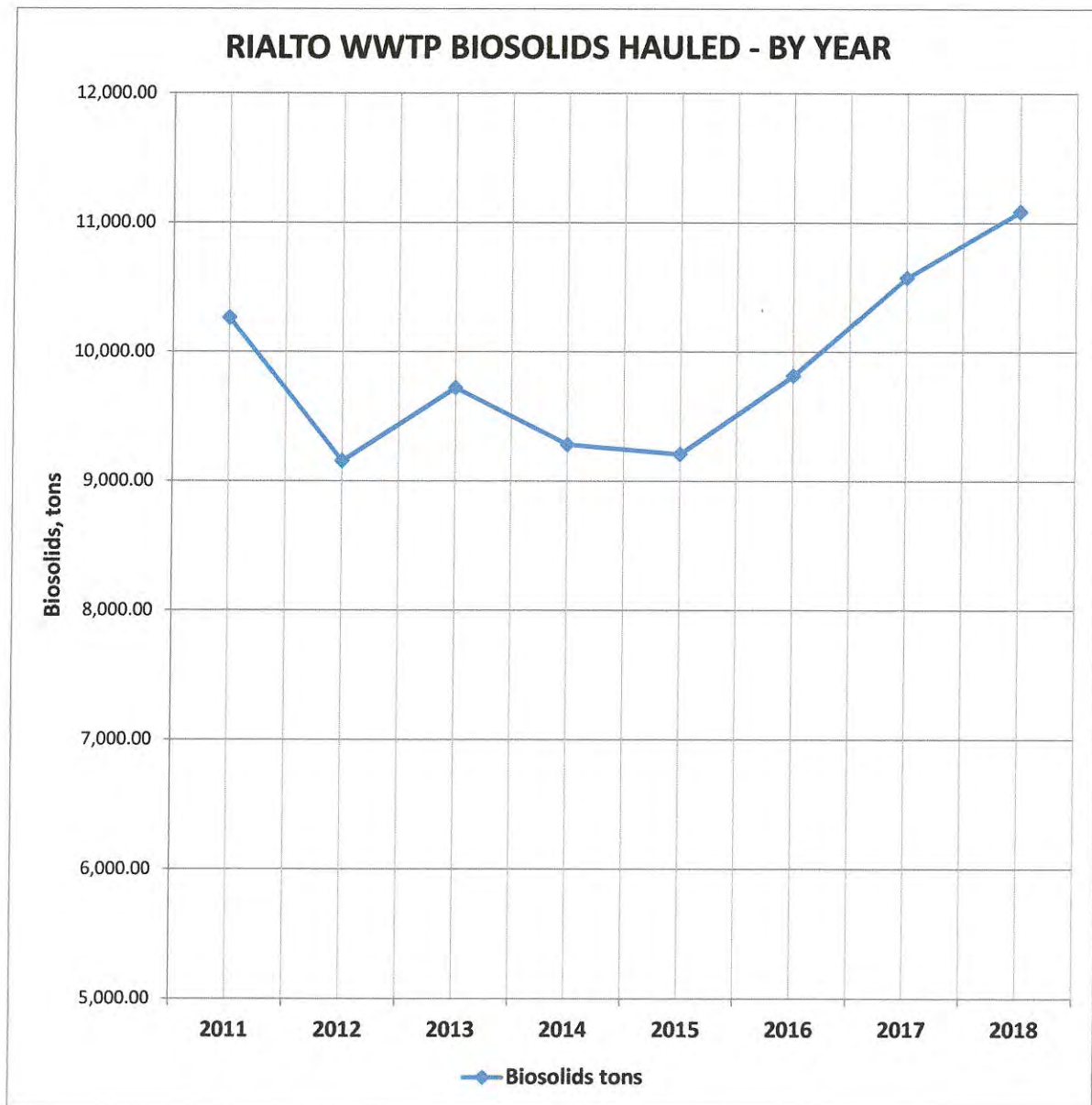
BIOSOLIDS DATA

MONTHLY BIOSOLIDS HAULED	
Month	Biosolids Hauled tons
January-18	975.61
February-18	1,055.77
March-18	986.53
April-18	1,087.06
May-18	923.49
June-18	564.30
July-18	1,311.03
August-18	553.74
September-18	885.68
October-18	803.37
November-18	570.82
December-18	1,369.63
<b>Average</b>	<b>923.92</b>
<b>Total</b>	<b>11,087.03</b>





ANNUAL BIOSOLIDS HAULED	
Year	Biosolids tons
2011	10,264.44
2012	9,157.31
2013	9,722.53
2014	9,284.26
2015	9,208.72
2016	9,815.48
2017	10,574.00
2018	11,087.03
Average	9,889.22

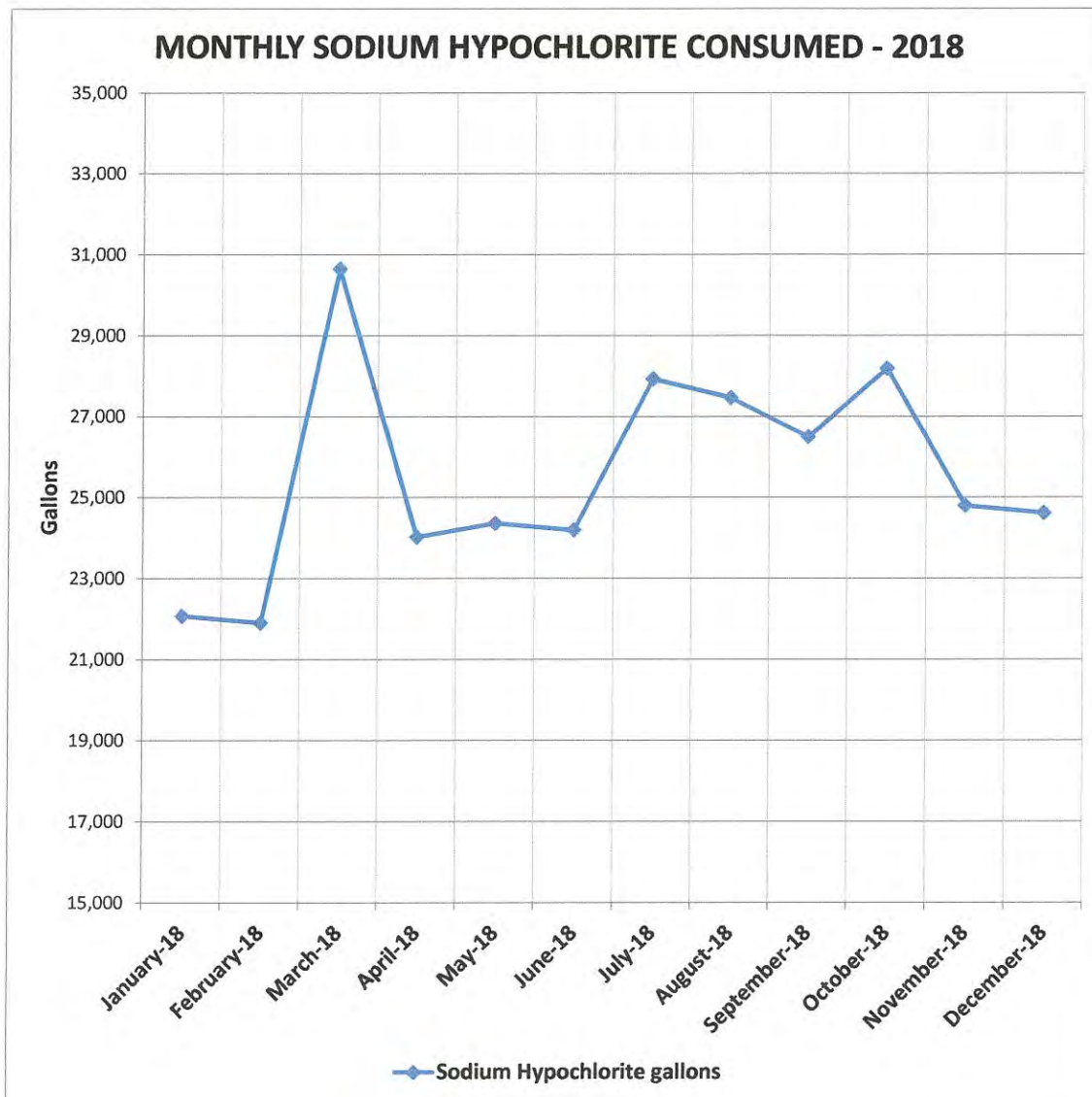


APPENDIX I

CHEMICALS DATA

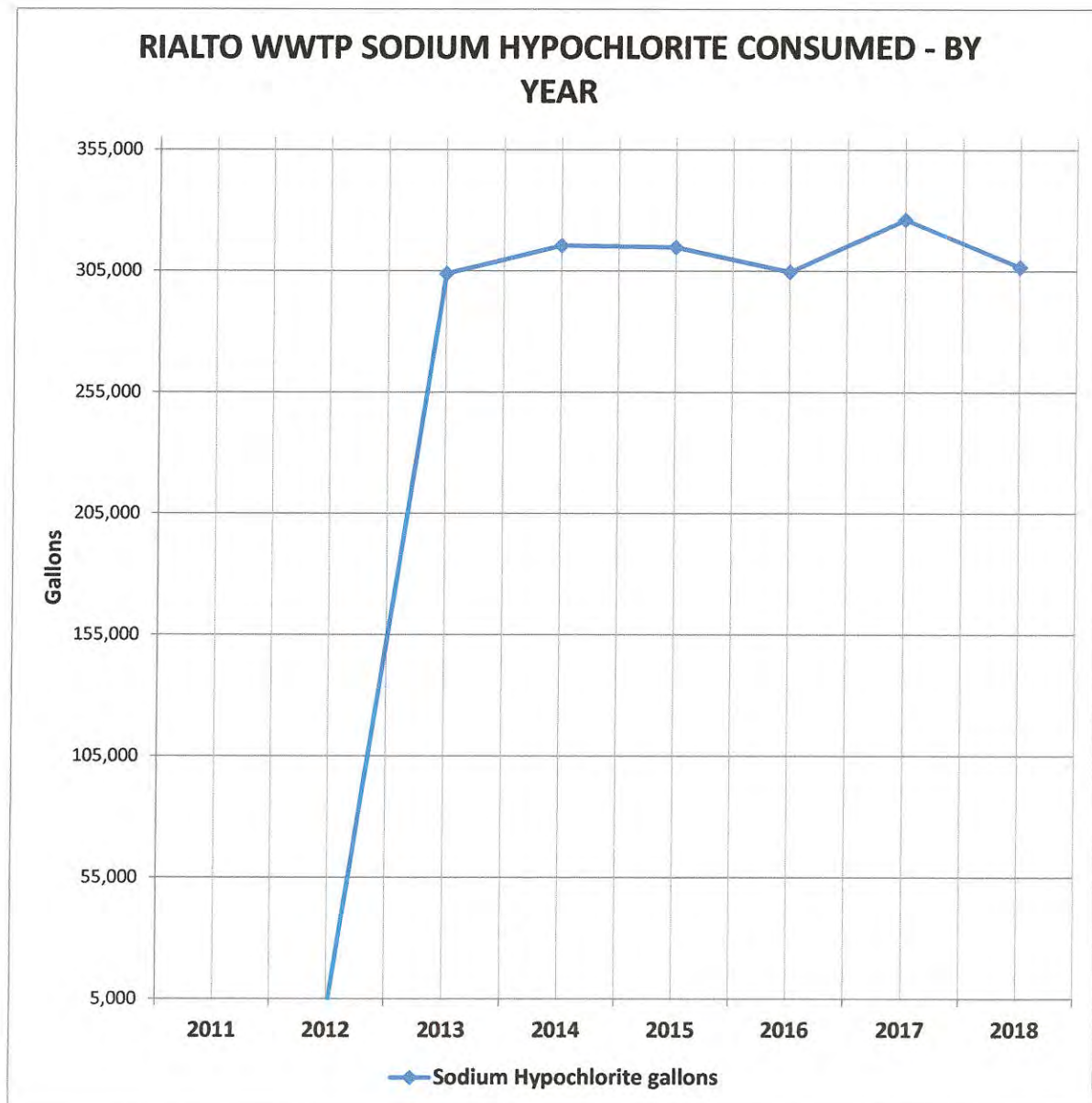


MONTHLY SODIUM HYPOCHLORITE CONSUMED	
Month	Sodium Hypochlorite gallons
January-18	22,074
February-18	21,904
March-18	30,649
April-18	24,027
May-18	24,366
June-18	24,197
July-18	27,932
August-18	27,465
September-18	26,489
October-18	28,187
November-18	24,791
December-18	24,621
<b>Average</b>	<b>25,559</b>
<b>Total</b>	<b>306,702</b>

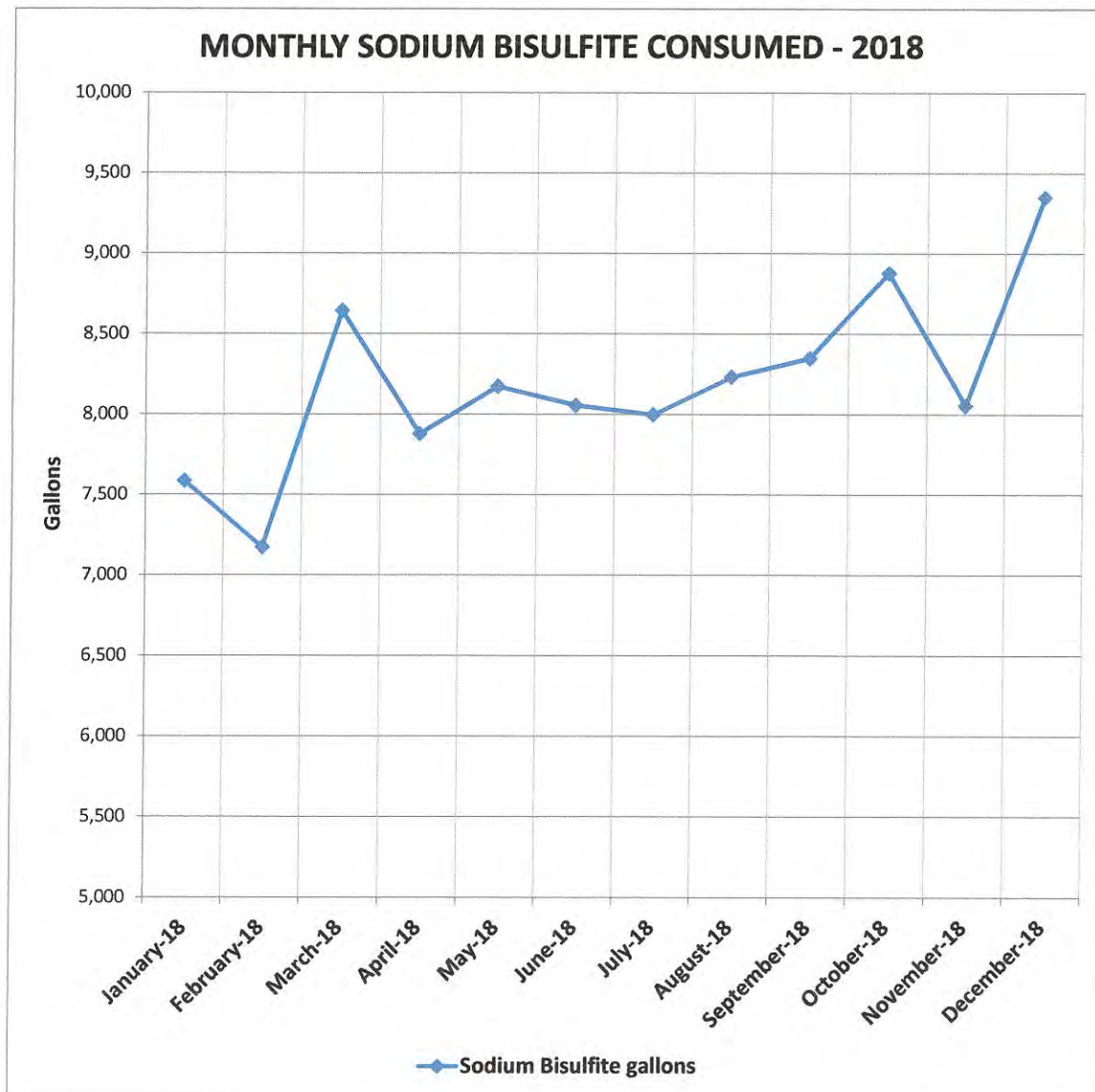


ANNUAL SODIUM HYPOCHLORITE CONSUMED	
Year	Sodium Hypochlorite gallons
2011	N/A*
2012	N/A*
2013	303,934
2014	315,573
2015	314,894
2016	304,706
2017	326,271
2018	306,702
<b>Average</b>	<b>312,013</b>

\* Data unavailable



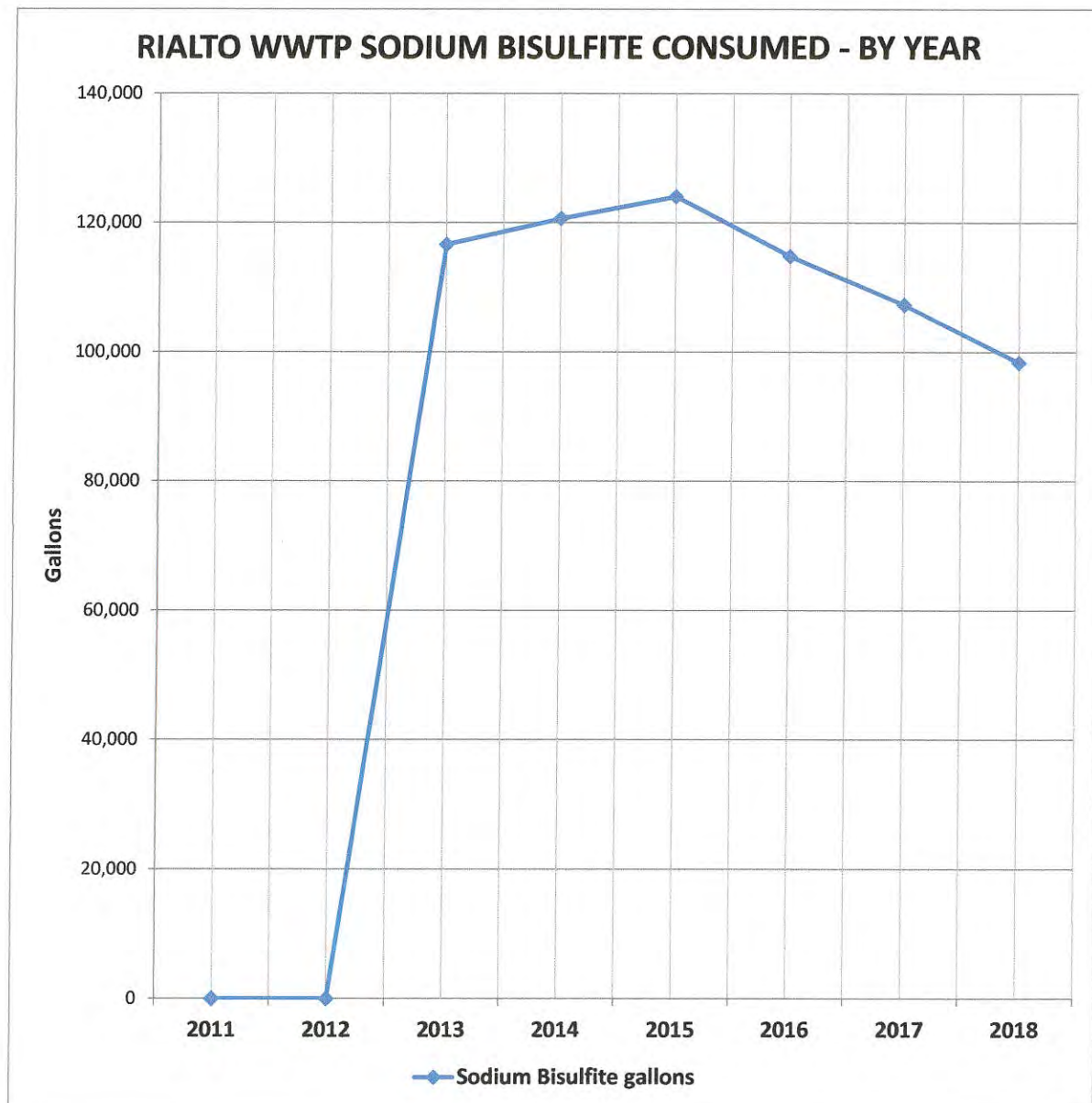
MONTHLY SODIUM BISULFITE CONSUMED	
Month	Sodium Bisulfite gallons
January-18	7,585
February-18	7,174
March-18	8,644
April-18	7,879
May-18	8,173
June-18	8,056
July-18	7,997
August-18	8,232
September-18	8,348
October-18	8,878
November-18	8,056
December-18	9,350
<b>Average</b>	<b>8,198</b>
<b>Total</b>	<b>98,372</b>





ANNUAL SODIUM BISULFITE CONSUMED	
Year	Sodium Bisulfite gallons
2011	N/A*
2012	N/A*
2013	116,630
2014	120,658
2015	124,068
2016	114,836
2017	107,309
2018	98,372
<b>Average</b>	<b>113,646</b>

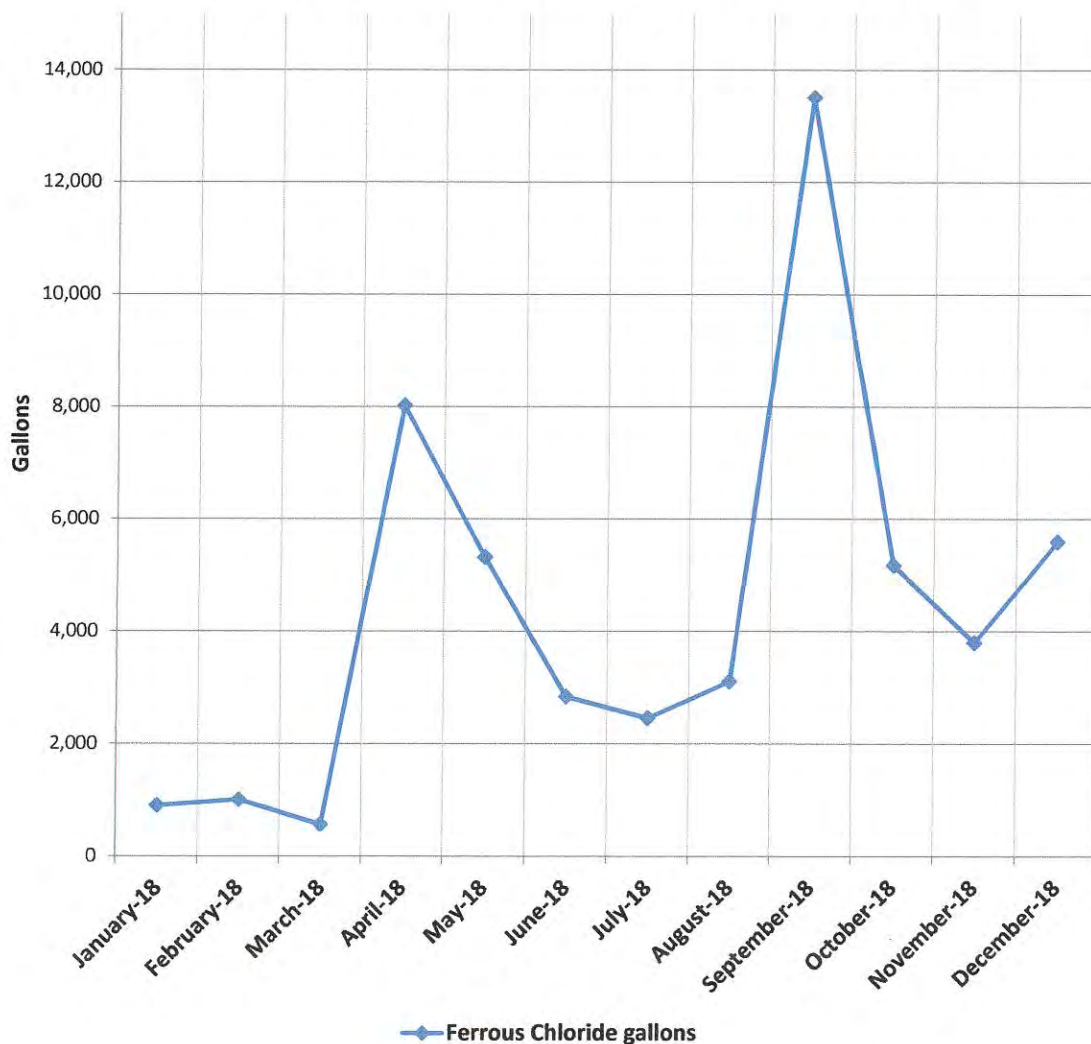
\* Data unavailable



**MONTHLY FERROUS CHLORIDE  
CONSUMED**

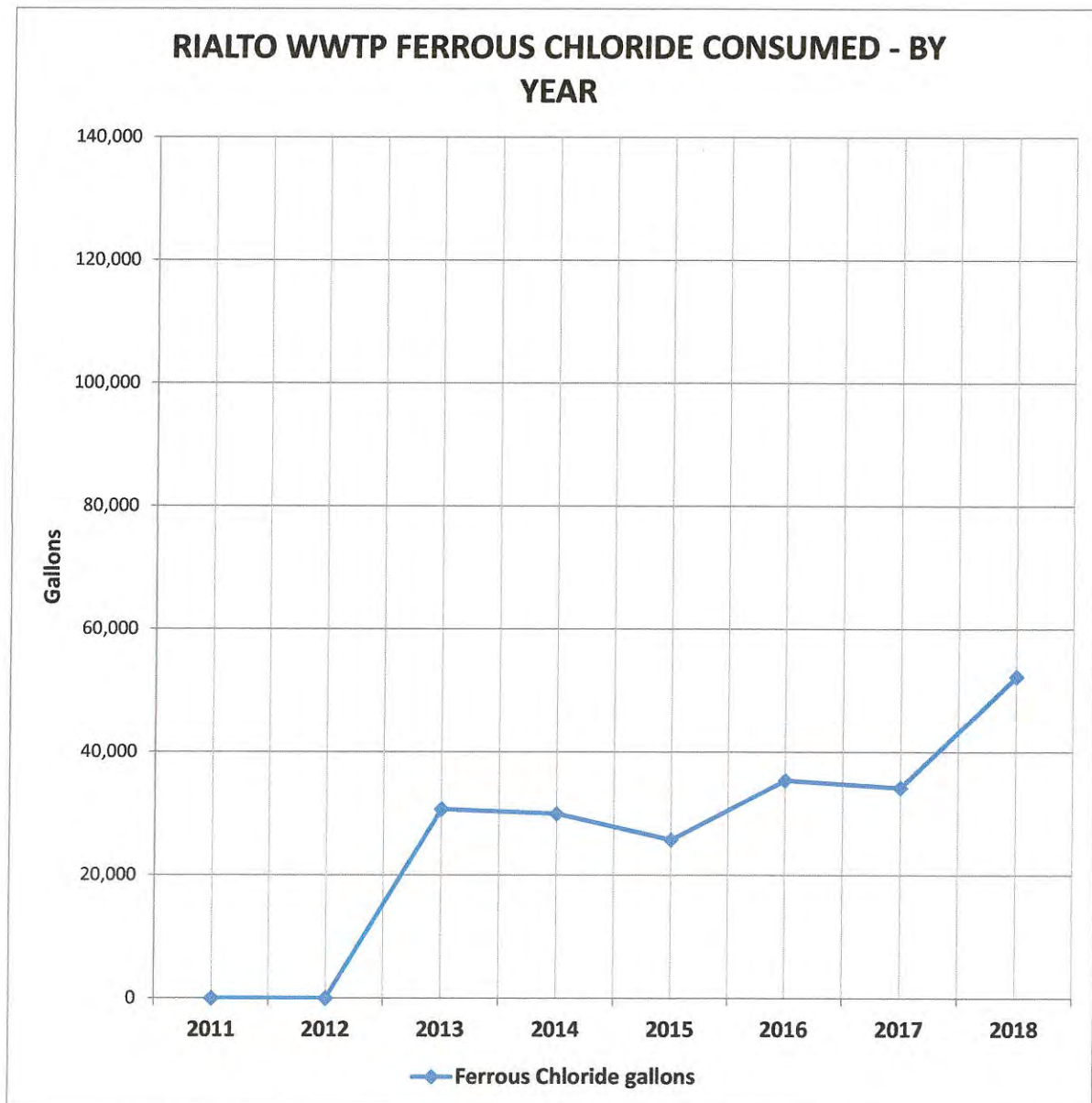
Month	Ferrous Chloride gallons
January-18	903
February-18	1,007
March-18	566
April-18	8,018
May-18	5,320
June-18	2,841
July-18	2,456
August-18	3,107
September-18	13,514
October-18	5,178
November-18	3,800
December-18	5,596
<b>Average</b>	<b>4,359</b>
<b>Total</b>	<b>52,306</b>

**MONTHLY FERROUS CHLORIDE CONSUMED - 2018**



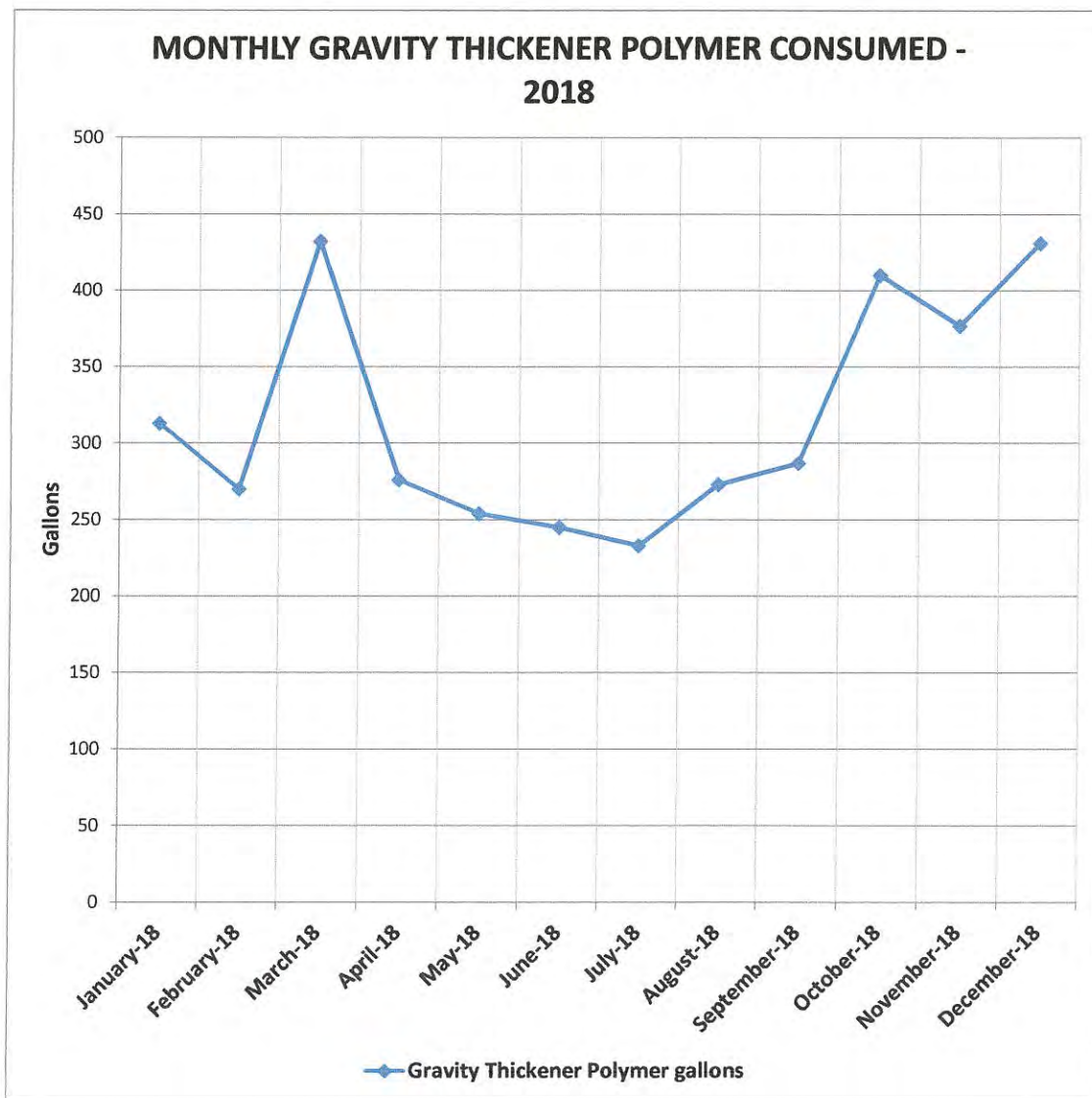
ANNUAL FERROUS CHLORIDE CONSUMED	
Year	Ferrous Chloride gallons
2011	N/A*
2012	N/A*
2013	30,709
2014	29,987
2015	25,769
2016	35,416
2017	34,216
2018	52,306
Average	34,734

\* Data unavailable



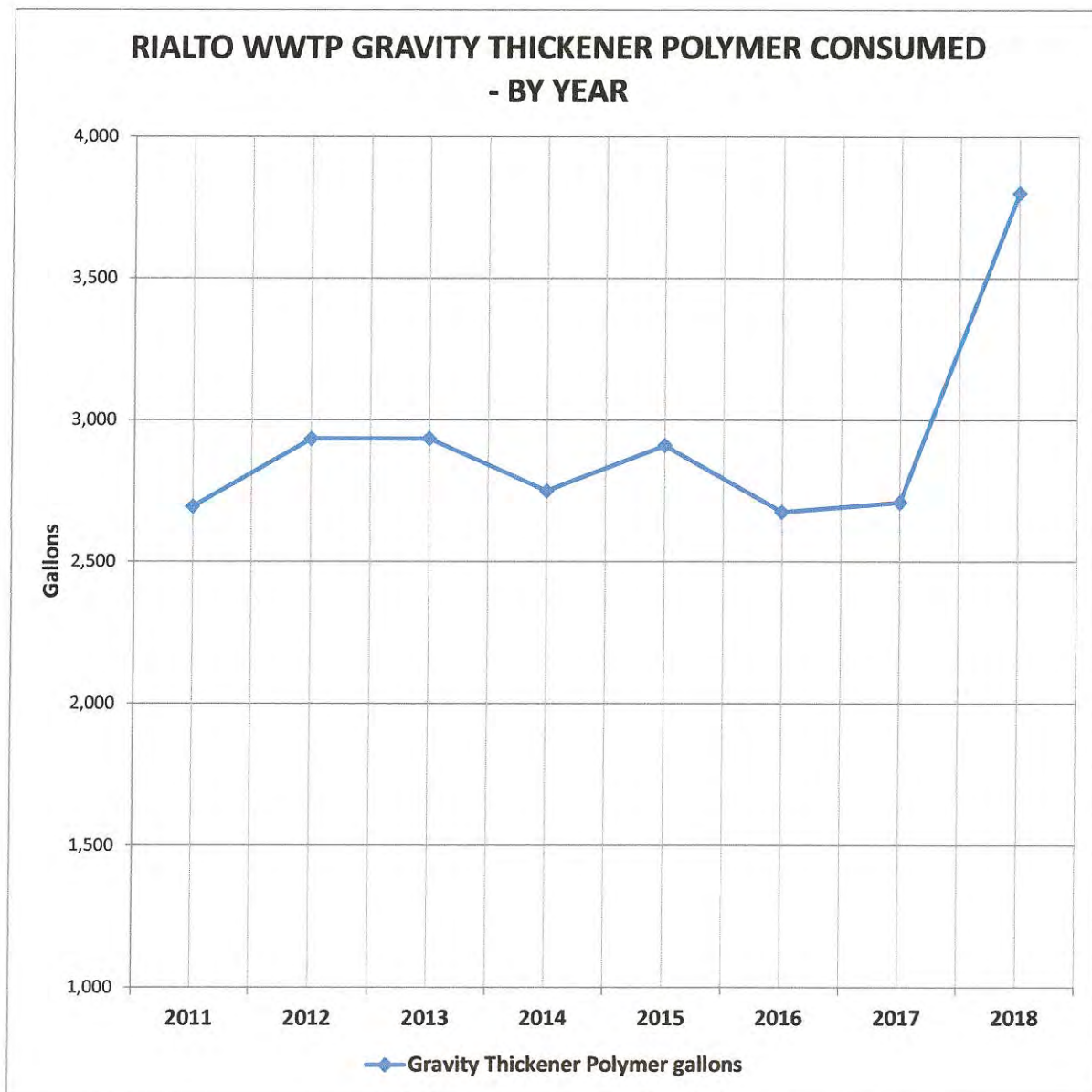


MONTHLY GRAVITY THICKENER POLYMER CONSUMED	
Month	Gravity Thickener Polymer gallons
January-18	313
February-18	270
March-18	432
April-18	276
May-18	254
June-18	245
July-18	233
August-18	273
September-18	287
October-18	410
November-18	377
December-18	431
<b>Average</b>	<b>317</b>
<b>Total</b>	<b>3,801</b>

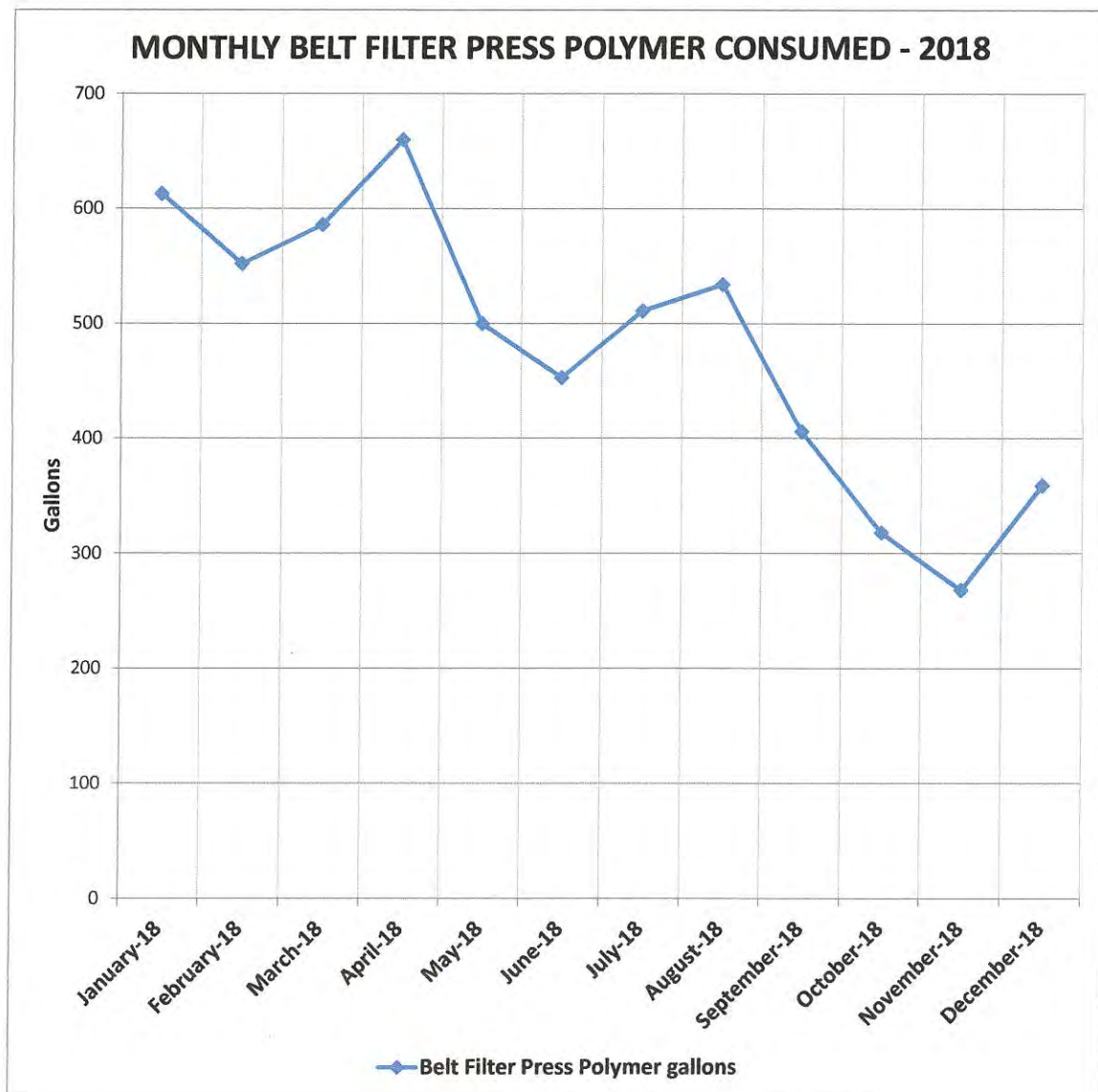




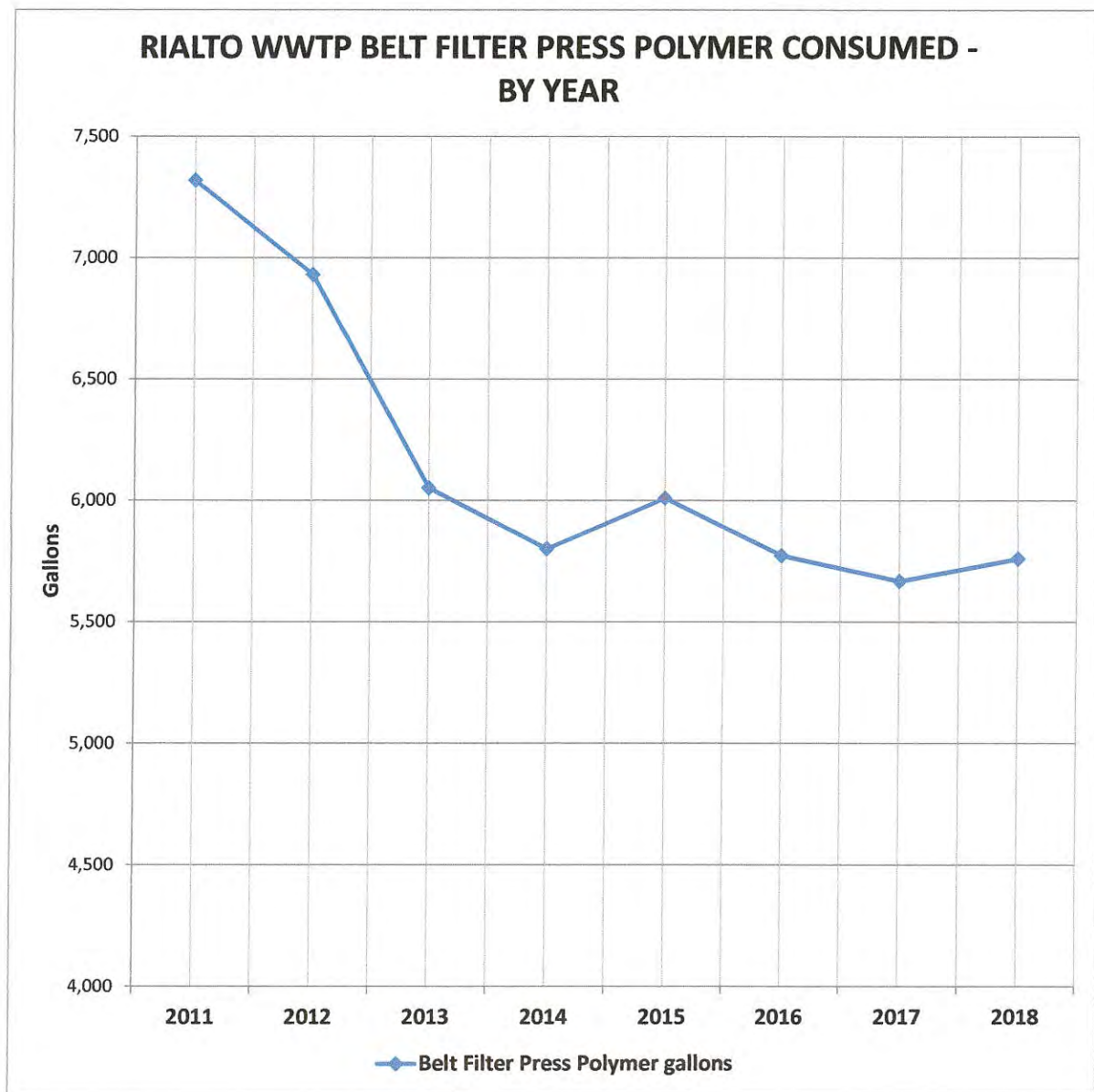
ANNUAL GRAVITY THICKENER POLYMER CONSUMED	
Year	Gravity Thickener Polymer gallons
2011	2,695
2012	2,934
2013	2,935
2014	2,750
2015	2,910
2016	2,676
2017	2,710
2018	3,801
Average	2,926



MONTHLY BELT FILTER PRESS POLYMER CONSUMED	
Month	Belt Filter Press Polymer gallons
January-18	613
February-18	552
March-18	586
April-18	660
May-18	500
June-18	453
July-18	511
August-18	534
September-18	406
October-18	318
November-18	268
December-18	359
<b>Average</b>	<b>480</b>
<b>Total</b>	<b>5,760</b>

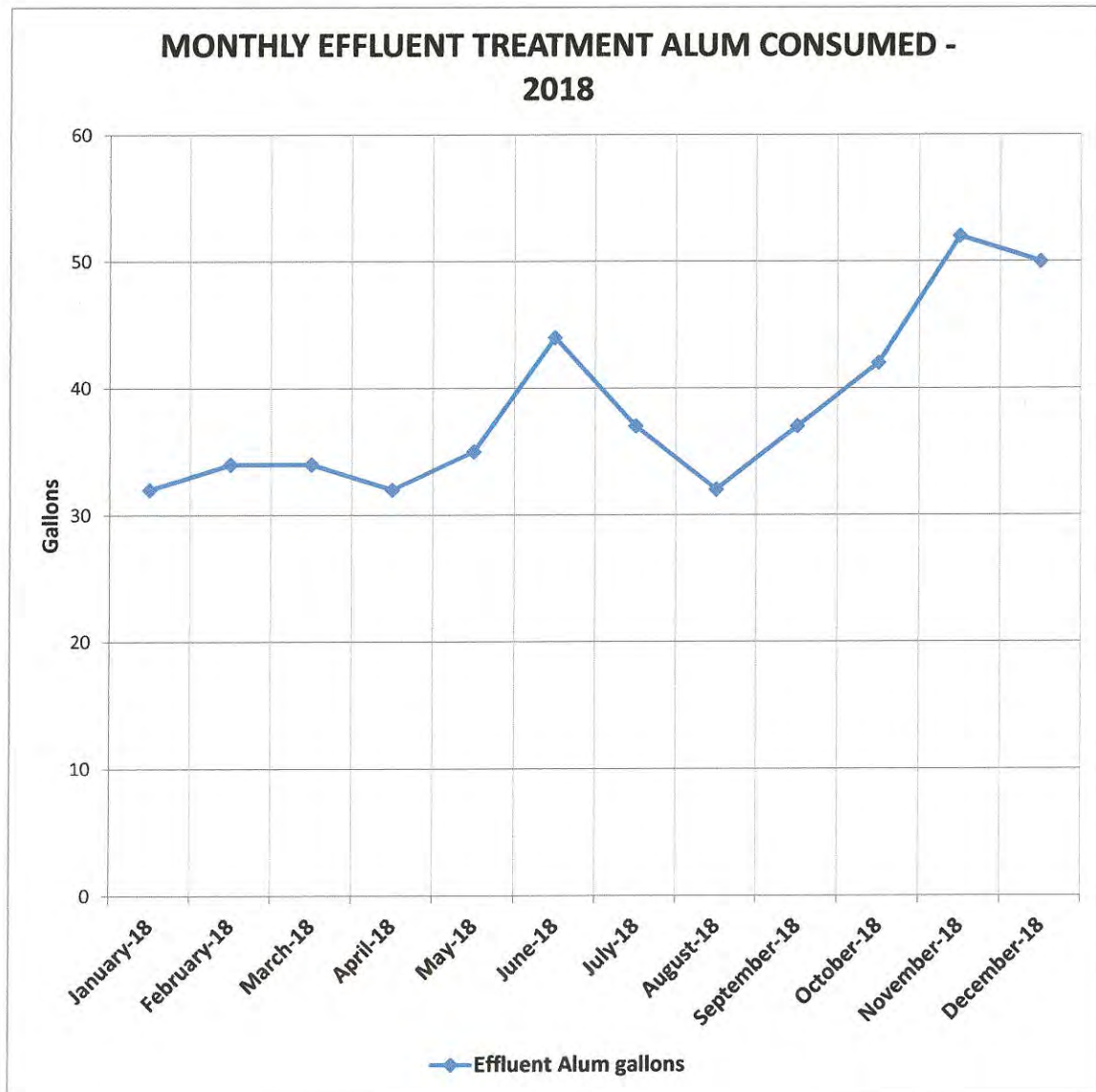


ANNUAL BELT FILTER PRESS POLYMER CONSUMED	
Year	Belt Filter Press Polymer gallons
2011	7,319
2012	6,931
2013	6,052
2014	5,801
2015	6,010
2016	5,773
2017	5,668
2018	5,760
<b>Average</b>	<b>6,164</b>

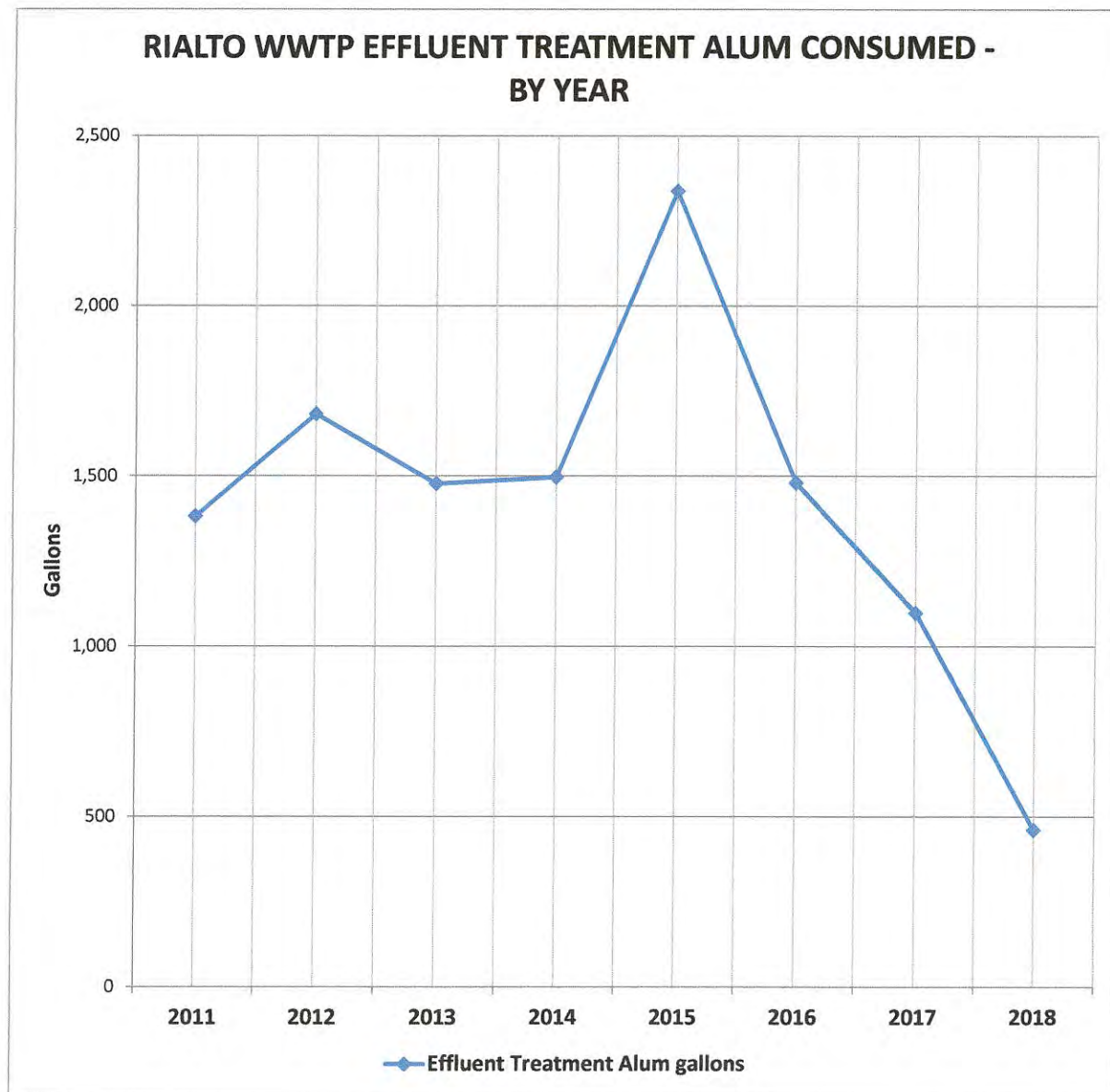




MONTHLY EFFLUENT TREATMENT ALUM CONSUMED	
Month	Effluent Alum gallons
January-18	32
February-18	34
March-18	34
April-18	32
May-18	35
June-18	44
July-18	37
August-18	32
September-18	37
October-18	42
November-18	52
December-18	50
<b>Average</b>	<b>38</b>
<b>Total</b>	<b>461</b>



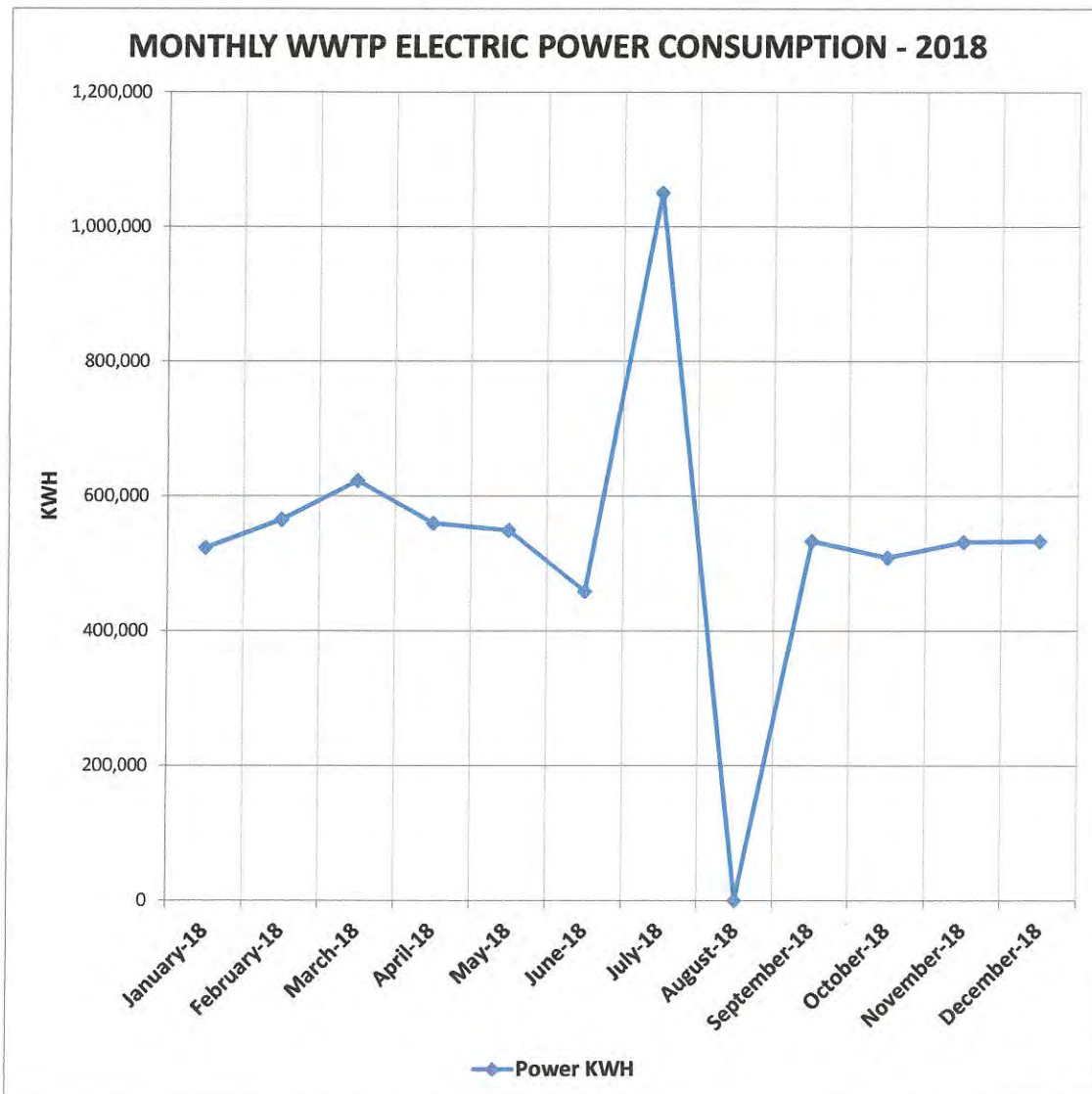
ANNUAL EFFLUENT TREATMENT ALUM CONSUMED	
Year	Effluent Treatment Alum gallons
2011	1,382
2012	1,682
2013	1,478
2014	1,497
2015	2,338
2016	1,480
2017	1,098
2018	461
Average	1,427



APPENDIX J

UTILITIES DATA

MONTHLY WWTP ELECTRIC POWER CONSUMPTION	
Month	Power KWH
January-18	523,432
February-18	565,248
March-18	622,864
April-18	559,952
May-18	549,128
June-18	458,465
July-18	1,050,808
August-18	0
September-18	533,132
October-18	508,808
November-18	531,820
December-18	533,228
<b>Average</b>	<b>536,407</b>
<b>Total</b>	<b>6,436,885</b>

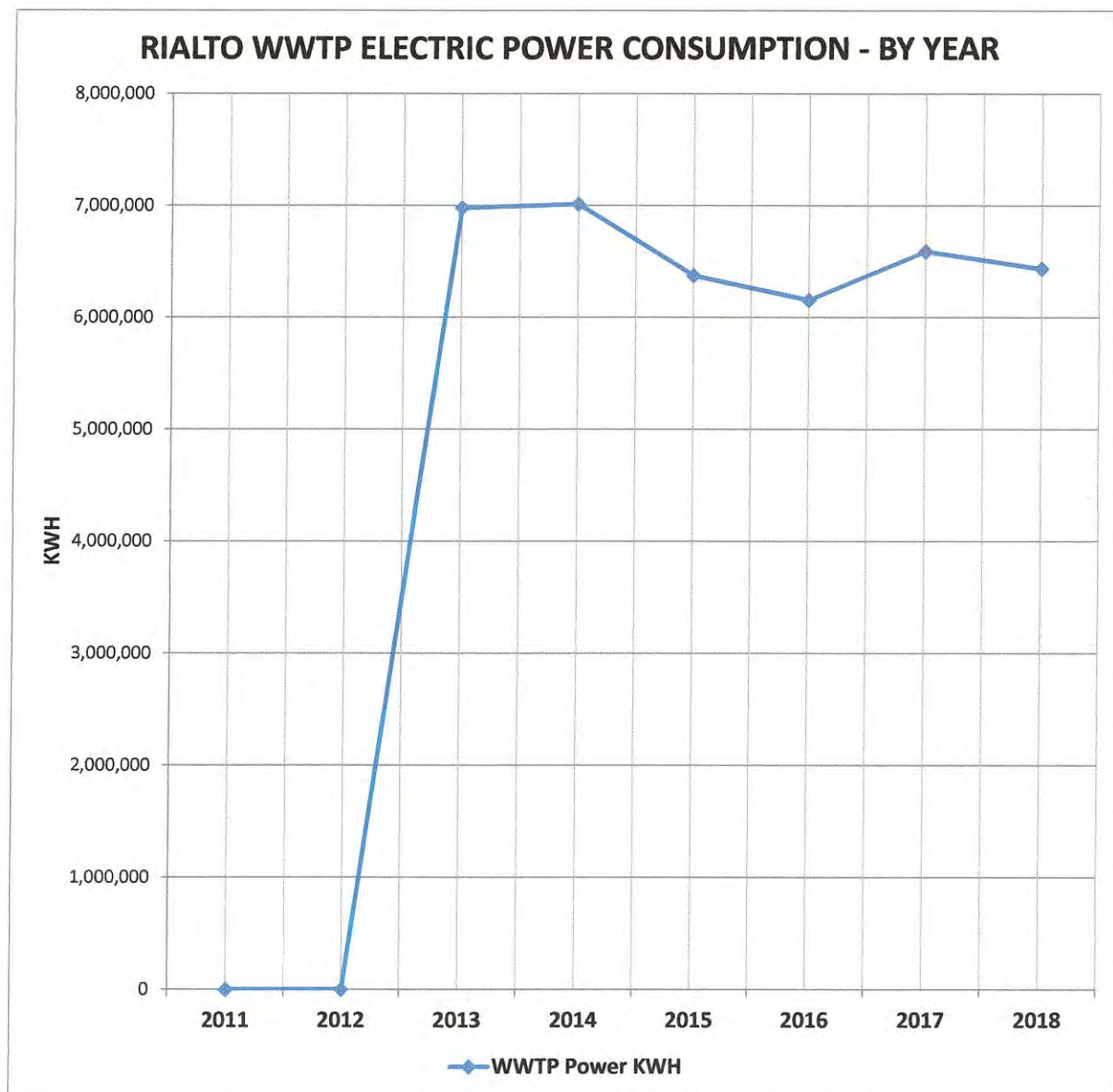


\* Due to Southern California Edison utility service work, July and August electric invoices were combined into a single July invoice

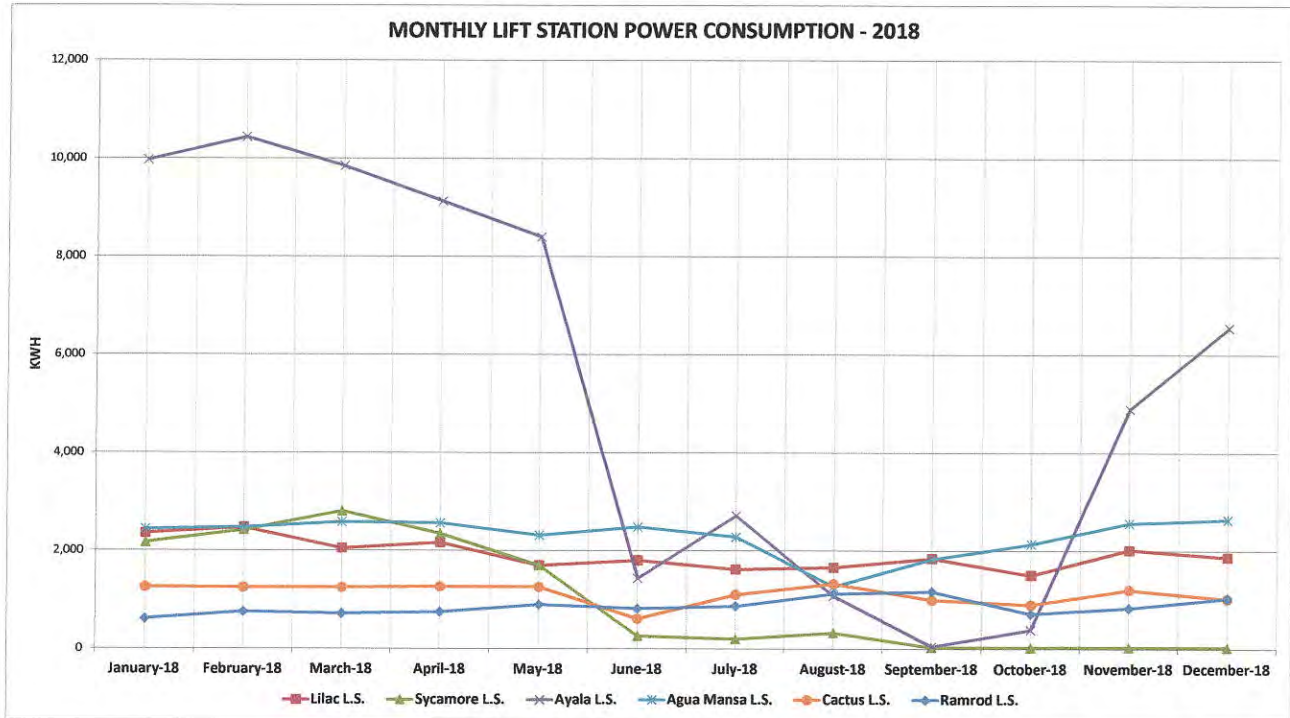


ANNUAL WWTP ELECTRIC POWER CONSUMPTION	
Year	WWTP Power KWH
2011	N/A*
2012	N/A*
2013	6,979,972
2014	7,014,116
2015	6,375,488
2016	6,156,340
2017	6,592,712
2018	6,436,885
<b>Average</b>	<b>6,592,586</b>

\* Electric power consumption not recorded until 2013



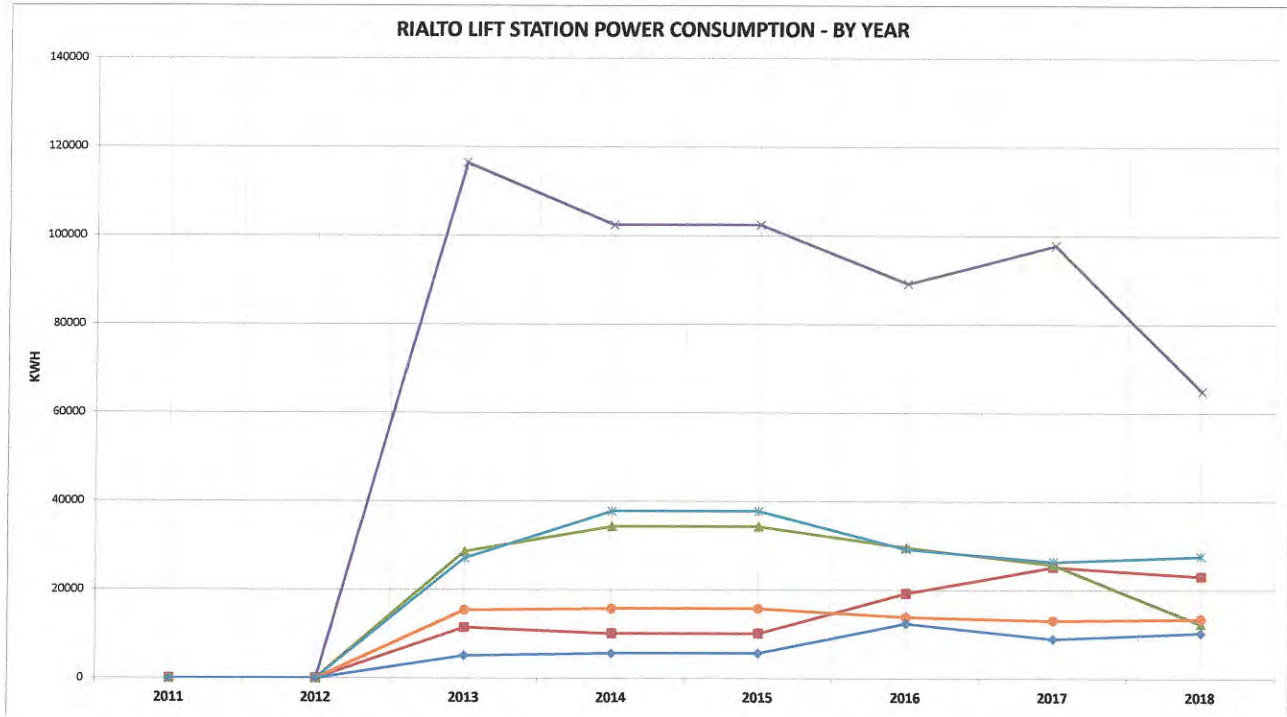
MONTHLY LIFT STATION POWER CONSUMPTION						
Month	Lilac L.S.	Sycamore L.S.	Ayala L.S.	Agua Mansa L.S.	Cactus L.S.	Ramrod L.S.
January-18	2,359	2,169	9,974	2,443	1,261	613
February-18	2,476	2,421	10,439	2,483	1,252	758
March-18	2,049	2,805	9,850	2,587	1,252	717
April-18	2,168	2,348	9,132	2,564	1,266	753
May-18	1,703	1,699	8,404	2,317	1,260	902
June-18	1,803	263	1,441	2,484	612	821
July-18	1,622	201	2,716	2,281	1,107	872
August-18	1,661	326	1,079	1,271	1,329	1,124
September-18	1,846	30	48	1,832	1,000	1,173
October-18	1,507	28	392	2,142	904	719
November-18	2,019	31	4,894	2,565	1,206	836
December-18	1,872	29	6,551	2,637	1,021	1,031
Average	1,924	1,029	5,410	2,301	1,123	860
Total	23,085	12,350	64,920	27,606	13,470	10,319



\* Unusually low power consumption at some lift stations due to ongoing pump and controls repairs

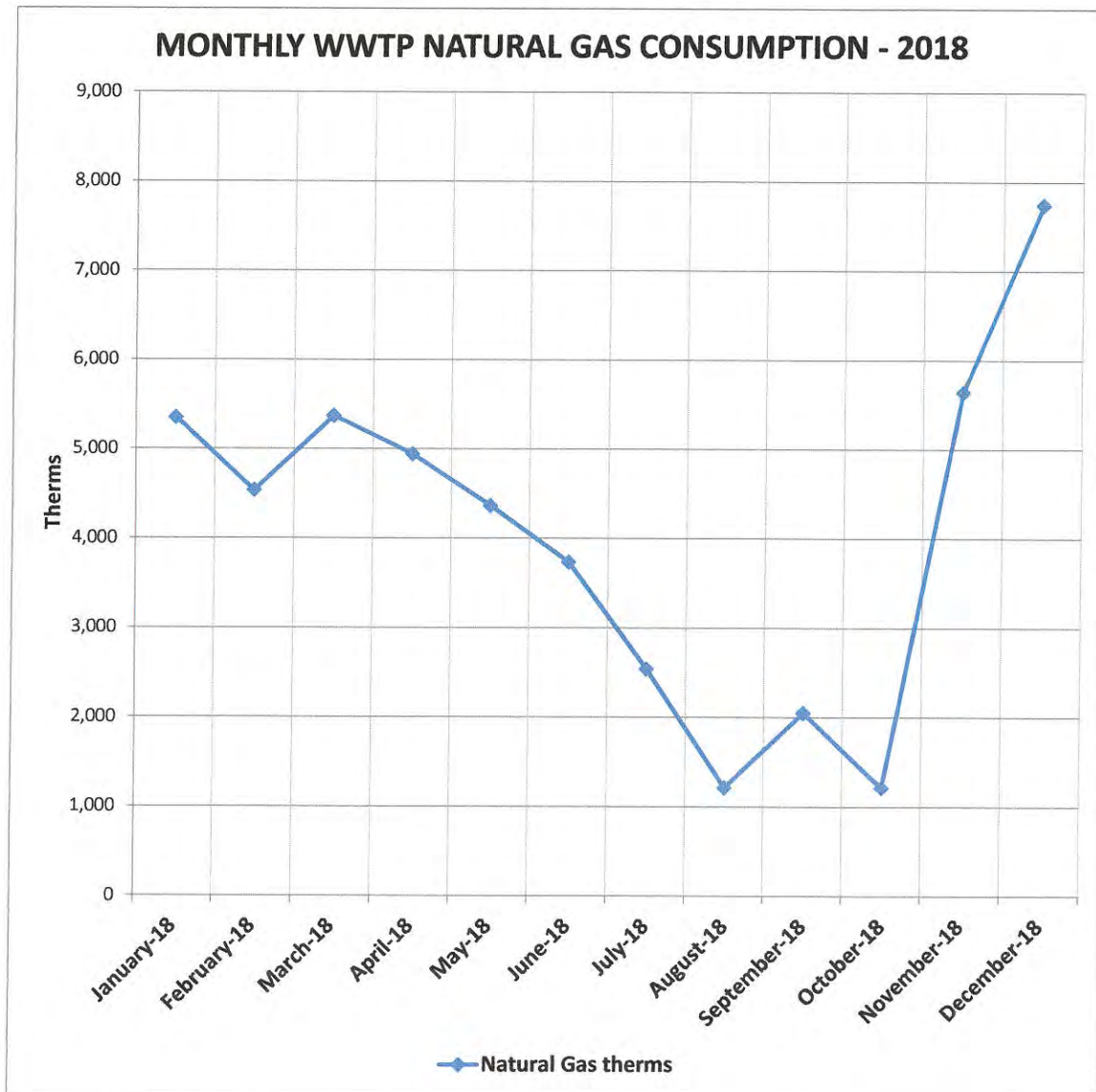
ANNUAL WWTP ELECTRIC POWER CONSUMPTION						
Year	Lilac L.S.	Sycamore L.S.	Ayala L.S.	Agua Mansa L.S.	Cactus L.S.	Ramrod L.S.
2011	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
2012	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
2013	11,500	28,651	116,486	27,124	15,399	5,154
2014	10,159	34,368	102,450	37,788	15,749	5,689
2015	10,159	34,368	102,450	37,788	15,749	5,689
2016	19,233	29,635	89,181	29,285	13,880	12,452
2017	25,228	25,694	97,821	26,374	13,129	8,986
2018	23,085	12,350	64,920	27,606	13,470	10,319
Average	16,561	27,511	95,551	30,994	14,563	8,048

\* Electric power consumption not recorded until 2013



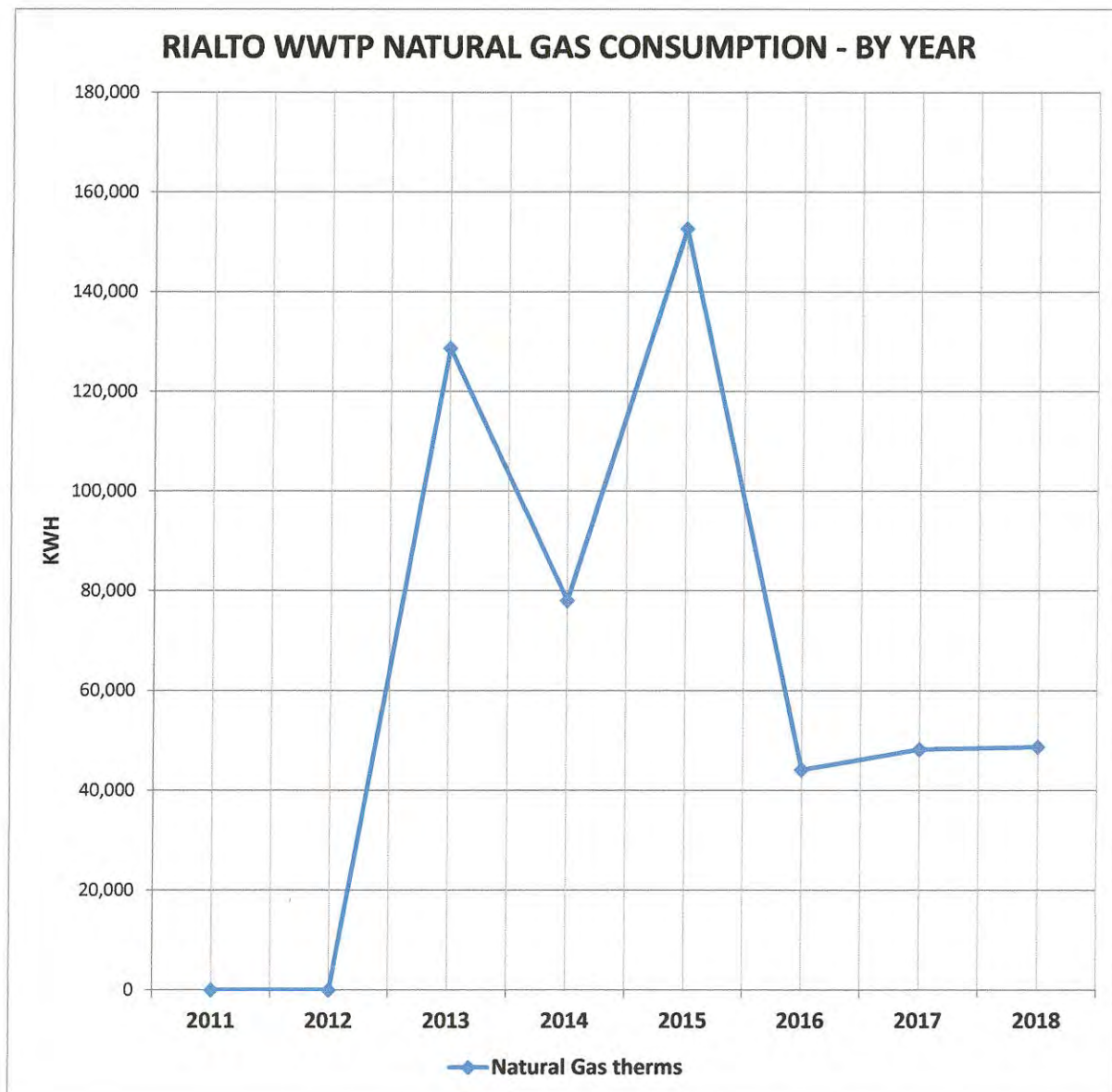


MONTHLY WWTP GAS CONSUMPTION	
Month	Natural Gas therms
January-18	5,352
February-18	4,538
March-18	5,372
April-18	4,944
May-18	4,368
June-18	3,736
July-18	2,540
August-18	1,215
September-18	2,051
October-18	1,215
November-18	5,645
December-18	7,742
<b>Average</b>	<b>4,060</b>
<b>Total</b>	<b>48,718</b>



ANNUAL WWTP NATURAL GAS CONSUMPTION	
Year	Natural Gas therms
2011	N/A
2012	N/A
2013	128,678
2014	78,030
2015	152,666
2016	44,130
2017	48,193
2018	48,718
<b>Average</b>	<b>83,403</b>

\* Natural gas consumption not recorded until 2013



**APPENDIX K**  
**ASSET MANAGEMENT**

## **ASSET MANAGEMENT SUMMARY**

The public looks to the City of Rialto, the Concessionaire (RWS), and Contractor (Veolia) to provide sound asset management practices that guarantee the City's infrastructure has sufficient reliability and capacity to meet present and future needs. Veolia's Asset Management program continues to align with the EPA 10 Step Asset Management Program and Veolia's global asset management principles. This Asset Management section summarizes the program executed by Veolia to ensure complete life cycle management of the wastewater asset during the 2018 year.

### **Asset Management Activities Completed in 2018**

Commencing in December 2013, Veolia established a state of the art asset management program for the Rialto's wastewater facility's aboveground assets, called OWAM and InfoNet for below ground assets. Veolia continues to update the Oracle Work and Asset Management (OWAM) database to reflect the changes in assets, as well as work to build the Graphical Information System (GIS) System of InfoNet for the collections system. During 2018, preparation for the S1 treatment plant upgrade has contributed greatly to a detailed look at assets as they are currently and their future state. This year Veolia retired 39 wastewater assets, and replaced 42 assets as a result of this detailed asset analysis.

### **Implementation/Maintenance of the CMMS Systems**

The Computerized Maintenance Management System (CMMS) platform for the Veolia wastewater Team is primarily the OWAM System for assets that are aboveground and InfoNet for below ground assets. The data is mirrored and interfaces into OWAM in order to track inventory and material usage. The two CMMS Systems are used to record work on City Asset for both Preventative and Corrective Maintenance.

Updating network assets is a continuous task. During the 2018 year Veolia updated over 10,643 underground assets within the collection system. Field crews using the data within the InfoNet System utilized the GIS features to guide their maintenance efforts, uncover differences between the data and their observations, and reported these findings to update the InfoNet database. In addition, the entire system was scrubbed and updated to reflect costs of replacement, and missing data point in order to deliver the Underground Baseline Facility Report. System changes related to Capital Projects went through the same process and further improved the systems precision. These updates are paramount to making decisions in regards to the Asset Management Strategy. The team continues to collect field data to update asset record that contain attribute information such as nameplate data, asset type, system hierarchy assignment, location, installation date, and replacement value. InfoNet's GIS System is essential to field work, as it allows the technicians to have geographic representation for assets, and connections that are below ground.

Under Preventative Maintenance work orders; there is a specific type of



Preventative Work Order called: Predictive Maintenance Work Orders or PdM. Both PM and PdM work orders are generated in accordance to Original Equipment Manufacturers' specifications in addition to industry best practices. The intervals include weekly, monthly, quarterly and annual intervals through the OWAM and InfoNet CMMS Systems. These scheduled tasks comply with warranty requirements during the warranty period, as well as the water industry's best practices coupled with criticality and condition assessments updated continuously with crew observations. Where applicable and relevant condition based predictive maintenance (PdM) work tasks have been assigned. These tasks provide an understanding of the condition of the asset and provide advanced warning when interventions need to be scheduled as corrective work. Each preventive work order is captured in the InfoNet System with the following details: labor hours, spare parts, materials, services, vehicles used, and directly purchased items are captured when the work order is completed. The underground assets and lift station data is recorded in the InfoNet System and is prepared for integration into the system of financial record, OWAM.

### **Interface of CMMS Systems**

An interface was developed and continued to be enhanced in 2018 that allows InfoNet to link to the OWAM CMMS systems. This year we have focused on creation of Bill of Materials for each asset – the key being ordering all materials through stock parts that are maintained in inventory through perpetual ledger. Additional detailed cost reporting was developed to take advantage of the integrated cost data. Asset Bill of Materials were built out in detail, as all parts are now being purchased through stock codes that are assigned to assets for: 1) ease and repeatability of reordering, 2) in preparation for the auto-reorder method of inventory, 3) detailed asset history, and 4) to allow for quick identification of obsolete parts related to retiring plants.

This interface allowed for full utilization of the inventory and purchasing management systems for both above and below ground assets. Additional detailed cost reporting was developed to take advantage of the integrated purchasing and asset data to ensure that reporting was optimized.

### **Update of Asset Management Reports**

The Baseline Facility Record is an inventory of all Facility in-service and out-of-service aboveground assets, and in 2018 this process was extended to include all underground assets. The reported OWAM data is a critical piece of our Interface capability. This record includes the asset's ID, description, system hierarchy, equipment/structure designation, status, criticality, condition scores, useful life, install date, remaining life, replacement cost, manufacturer, building, and projected overhaul cost and frequency. Each field is 100% populated for each aboveground asset in the record and 100% populated for underground asset data provided by the City; which is a total 61% populated for all fields. Annual updates are based on

repair and replacement information logged in the OWAM CMMS.

The 2018 asset management updates included updates to each asset for remaining life, condition and criticality as well as status change for 10,643 assets. For aboveground asset, 39 were placed in retirement, one asset was placed in inactive, and 42 assets were installed in 2018. In 2018, we identified nine additional assets that were previously installed and ensured that they had corresponding OWAM asset identifications. The Baseline Facility Report (BFR) tracks the overall asset health through condition and criticality as it relates to individual City assets. In the 2018 reporting year, the BFR tracked 1,759 aboveground assets and 10,643 below ground assets; for a total of 12,402 assets. The work will continue in 2019 as we will continue to develop a plan to partner with the city to ensure a data sharing process for underground assets.

The BFR database is regularly used to optimize maintenance activities and to define Operating Repair and Replacement (OR&R) and Capital projects. These evaluations are then used to establish Repair and Replacement Budgets as well as Capital Improvement Project recommendations over a running five-year period. Operational history is accounted for in the recommendations with a focus on projects that will improve operational efficiency and reliability. Considering repair versus replacement decisions, factors such as failure history, spares availability, energy efficiency, and new technologies are considered.

The Asset Investment Strategy document summarizes the key components to the comprehensive asset management program that is utilized to carry out the proper and efficient management of the wastewater systems. This strategy document outlines how the categorical priorities are used to determine the investment allotment across the assets.

### **Condition Assessment and Predictive Maintenance**

Optimized maintenance is a blend of approaches, targeted to ensure a required Level of Service with an acceptable level of risk. A systematic relative criticality analysis review was completed for the Rialto Wastewater aboveground assets in 2013 and updated in 2018. This process prioritizes aboveground assets based on rankings from a standardized scale of 1 to 5, where 1 is minor and 5 is critical, for consequence and likelihood of worst case failure scenarios. Applying this process to each aboveground asset ensures that maintenance management and capital decisions meet the Level of Service business objectives. Underground network assets receive condition and criticality scores based on analysis of upstream impact, diameter of the pipe, maximum individual pipe diameter upstream of the pipe, average pipe diameter upstream, length of the pipe, and scaling condition score constants. In addition, criticality is assigned using factors such as number of upstream connections, supply to critical assets such as hospitals, assets that run underneath critical infrastructure such as railways or interstates, magnitude of overflows, etc.

Thermo-graphic analysis is essential to the condition assessment of City assets, and our Asset Management Program. Veolia conducted this analysis in 2018 through Predictive Services on select assets as part of an ongoing effort to provide best practices in asset maintenance. This is an annual practice to minimize invasive maintenance which helps prolong asset life and minimize life cycle costs. Based on results, corrective maintenance was performed to correct deficiencies.

Utilizing the results of the 2018 asset condition and criticality assessment the Veolia wastewater team achieved a milestones as they completed the first round of ensuring that critical spares are: 1) identified, 2) stock codes are created, 3) Bill of Materials are updated to reflect the critical spares, and 4) purchased and available in inventory. The team focused on expanding upon monthly inventory assessment that was based on the foundation of the asset, to include ensuring critical spares were at hand. The focus went to assets that will be included in the plant's process after S1.

### **Maintenance and Capital Budget Reports**

A key output of the Asset Management Program is the development of the projected investment plans based on meeting the Level of Service expectations. With limited resources it is important to ensure that developed plans are aligned with defined needs and available finances. Using the asset analysis listed above: criticality ranking, condition ranking, and anticipated remaining life projection categories were identified through these evaluations to establish Repair and Replacement Budgets as well as Capital Improvement Project recommendations over the next five years. Operational history is accounted for in the recommendations with a focus on projects that will improve operational efficiency and reliability. Considering repair versus replacement decisions, factors such as failure history, spares availability, energy efficiency and new technologies were considered. Estimated cost to complete repairs and replacements were established using existing capital plan data and data from Veolia's corporate data base as well as locally established repair cost projections. Annual Repair and Replacement Projects and Capital Projections were submitted in 2018.

### **Planned 2019 Asset Management Activities**

The following summarizes planned asset management program activities for 2019:

#### **Store Room Development and Management**

Veolia completed four cycle counts at the wastewater facility this year. The team is now engaged in the organization of our storeroom as they work to manage inventory checkout to work orders. Two wall to wall cycle count were conducted in 2018 to ensure accurate inventory counts and to look at purchasing trends for 2018 to negotiate better price points. Training of staff to control inventory flow is ongoing, as we now pursue Inventory Management best practice techniques. In addition all materials are now being purchased with a stock code that is assigned

to an asset's bill of material. This allows for strict tracking of the asset's costs. In 2019, the team will focus on creating an auto reorder process that reflects an analysis of 2017-2018 trends in purchasing and material use.

### **Reliability-Centered Maintenance (RCM) Analysis**

RCM analysis is used to develop a less invasive maintenance program on critical systems as part of the asset management toolkit. Formal RCM analysis has been postponed at wastewater due to S1 demands. RCM analysis training was completed with the water and wastewater team. The training tools were used for a mock analysis at water for process improvement around inventory management as a part of asset management strategies, work order management and planning. The 2018 work focused on stock code creation, a result of the RCM training of 2017. The results of this RCM benefited the wastewater team, as lessons learned were shared and implemented.

### **Performance Evaluation of Asset Management Practices**

A comprehensive audit was completed at the facilities in relation to Maintenance and Asset Management processes. This audit consisted of three major components. An action item list has been developed from the audit process with assignments and target dates established.

The first component was a review of the contract language to identify maintenance and asset management deliverables and evaluate the completion of these items. The 2018 contract deliverables included the Baseline Facility Record, Hot Spot List, Operating R&R (Repair and Replace) Budget, Capital Plan, and Asset Investment Strategy, which were all previously submitted. Starting in October 2016, the regional asset management team began tracking MTBF (Mean Time between Failures) and MTTR (Mean Time to Repair) on a monthly basis. This data was used to enhance the Operating R&R and Capital plans. Additionally, this data is being reviewed to determine effective inventory management techniques that will reduce this mean time to repair. As the team has focused on inventory management in 2018, a milestone in 2018 was achieved for improved planning and scheduling. The SSMP update and audit were completed for 2018. Action items from this portion of the audit were incorporated into the overall audit process. The CCTV program for hot spots and the entire collection system was identified and implemented in 2016 and continue to be reviewed and analyzed during the 2018 year as repairs and replacements were made using FIP funding. Additionally, the CCTV data was used to create the first Baseline Facility Report for Underground Assets.

The second component was an evaluation of the CMMS systems. Overall, aboveground asset work tracking is being recorded within the OWAM system. This work tracking includes parts, materials, labor, failure coding, and documentation. New asset records are built as assets are added with required

fields populated. The monthly KPI (Key Performance Indicator) report is created as a tool to review completed and outstanding work for the month. A strong preventive and predictive program is in place and includes thermography, vibration, oil analysis, and electrical component testing. Results from the inspections and testing are incorporated into the condition assessment ranking data, with corrective maintenance work orders created based on findings.

For the below ground assets, work tracking is being recorded within the InfoNet system. In 2016 the collections system work tracking captured the work completed and identifies repairs and labor. In 2018 the team created a record of all work completed throughout the City of Rialto distribution network. In addition, 100% of the 258.85 miles of collection pipes have been assigned pipe dimensions. Corrective work orders are being created within InfoNet, and using the OWAM interface, the team is able to create a direct link between costs and the identified assets.

The third component was a review of maintenance and asset management practices onsite against Veolia Policies and Industry Best Practices. In addition to the CMMS documentation action items, several procedural milestones were achieved in 2018; such as planning and scheduling being transitioned to onsite staff. Progress was made in the onsite scheduling, as the focus of 2018 was improving the partnership between inventory and asset management. This partnership continues to allow for a decreased mean time to repair after inspection results indicated that repairs were needed to extend asset life and performance.

Overall, the Rialto wastewater treatment facility continues to progress in terms of CMMS utilization and repair and capital projection planning. The staff is conducting its maintenance activities in accordance with Veolia Policies and Industry Best Practices. Several reports have been developed and are utilized such as a monthly KPI (Key Performance Indicator) report, storeroom and PM Master QA reports, daily and monthly maintenance activity and time tracking reports, purchasing reports, a storeroom inventory valuation report and other reports as needed. These reports are stored on Optimas and can be run on-demand or scheduled.

The staff is using the criticality rankings for work planning, gathering condition assessment data during PM completion, and implementing processes for improved work budgeting tracking. The Operating R&R and Capital Plans were built utilizing both life cycle expectancies as well as condition field data to ensure projects are targeted in the appropriate years. Building on the strong core program and completing the identified action items will provide Rialto the data and processes necessary for ensuring a strong asset management program to optimize process efficiency and maintain regulatory compliance.

# **2019-2023 Five Year Capital Plan Rialto Wastewater Facilities**



**Prepared by:**





**2019-2023 Capital Plan**  
**Rialto Wastewater Facilities**

---

Table of Contents

1. INTRODUCTION	3
2. PROPOSED PROJECTS	3
FY 2019-2020 Summary of Capital Projects	4
FY 2019-2020 Capital Project Descriptions	5
FY 2020-2021 Summary of Capital Projects	8
FY 2020-2021 Capital Project Descriptions	9
FY 2021-2022 Summary of Capital Projects	12
FY 2021-2022 Capital Project Descriptions	13
FY 2022-2023 Summary of Capital Projects	15
FY 2022-2023 Capital Project Descriptions	16
FY 2023-2024 Summary of Capital Projects	19
FY 2023-2024 Capital Project Descriptions	20
FY 2024-2029 Summary of Capital Projects	23
FY 2024-2029 Capital Project Descriptions	24
3. CONCLUSION	28

## **1. INTRODUCTION**

Given the length of the contract term, it is necessary to undertake Capital Projects to modify, alter, expand or improve Wastewater Facilities (or any portion thereof) from its then-current condition beyond what has already been identified in the current FIP projects. Based both on actual needs and Asset Management Tools, this Plan recommends Wastewater Facility Capital Projects over the course of a five (5) year period of time from FY 2019/2020 through early half of FY 2023/2024, or in short, covering calendar years 2019 through 2024. Included in this year's CIP Plan is a section on the following five years, added for illustrative purposes of projects that will need to be addressed in the subsequent years (2024-2029). There is the potential that projects in the years 2024-2029, may require earlier priority based on sudden or exponential changes in the asset's criticality or condition.

Each asset is evaluated based on the criticality ranking, condition ranking, anticipated remaining life projections, and level of service expectations. These evaluations are then used to establish Repair and Replacement Budgets as well as Capital Improvement Project recommendations over a five year rolling period. The Capital Plan covers project needs greater than \$125,000. Operational and maintenance history is accounted for in the recommendations with a focus on projects that will improve system efficiency and reliability.

Based on the assessment briefly described above, capital needs were categorized for the year in which the improvement is anticipated to be required.

## **2. PROPOSED PROJECTS**

The table below is a cost summary of the proposed Capital Plan projects. Note that project costs are given a high level estimate (not engineered estimates) and each project will require a more detailed cost analysis prior to planning and initiation. All costs are present-day dollar estimates.

In the following section is a description of each project, rationale for the need, impact to operations, cost estimate, time frame, and delivery method. Below the project descriptions are cost summary tables that identify individual assets within each Capital Project.

When funding for these capital projects is secured, costs are subject to change based on further discovery during planning, design and construction bid submittal impacts. During the planning stages, staff may be better knowledgeable and able to use the Routine Repair and Replacement (RR&R) budget or the Operating Repair and Replacement (OR&R) budget to make the necessary improvements as applicable.

## FY 2019-2020 Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Backup Generator for Wastewater Plant and Lift Stations	Lack of Electrical Backup creates high risk for violations during power outages	N/A	\$3,000,000
Disk Filter Redundancy -- Integration of Fourth Disk Filter	Allows for newly installed S1 Disk Filter to be receive preventative maintenance and allows for growth in capacity	N/A	\$350,000
Manhole Replacement and Rehabilitation	Based on results of PM inspections	5	\$200,000
Aged Wastewater Main Replacement	History of HOT LIST and past pipe segment replacements	5	\$1,000,000
Total:			<b>\$4,550,000</b>

## FY 2019-2020

### Proposed Capital Improvement Project Descriptions

#### Backup Generators for Wastewater Plant and Lift Stations

<b>Problem or Opportunity:</b>	The Regional Water Quality Control Board (RWQCB) has raised concerns with the fact that standby power is not available at the WWTP. They have further indicated a preference for installation of an independent standby power generator. This project is contingent on formal notification by the Board that independent standby power is required.
<b>Assets Included:</b>	Multiple assets
<b>Condition Score:</b>	All associated assets have an average score of 4.17
<b>Criticality Score:</b>	All associated assets have scored a 5 in criticality
<b>Recommended Solution:</b>	Recommended industry practice is to provide standby power at wastewater plants and sewage pump stations. Ayala, Sycamore, Lilac, and Cactus stations currently lack standby power.
<b>Measurable Benefits:</b>	Prevention of outages and the compliance risks associated with such outages, all of which are concerns of the SCAQMD, the RWQCB and the Fish and Wildlife agency.
<b>Basis of Recommendation:</b>	NPDES compliance will most likely soon require an alternate source of backup power. There is currently no backup power availability should the primary source of power be lost.
<b>Assumptions / Risks:</b>	Although Southern California Edison (SCE) has replaced the main power switch gear which can provide power from one grid over another in the event of an outage, there is still no guarantee of continued power supply.
<b>Primary Driver:</b>	Continued process operation and compliance
<b>Cost Estimate:</b>	\$3,000,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Disk Filter Redundancy -- Installation of a Fourth Disc Filter

<b>Problem or Opportunity:</b>	The original scope of S1 included the purchase and installation of four new Disc Filters. In a joint effort to reduce the overall S1 project costs the fourth disc filter was removed which means that the filtration system lacks internal redundancy necessary to maintain capacity when the filter units need to be taken out of service for required maintenance. This project is for the installation of a fourth disc filter, which allows three disc filters to remain in service during preventative and repair activities.
<b>Assets Included:</b>	New asset to be assigned an OWAM ID at installation
<b>Condition Score:</b>	New asset will have a score of 1 assigned
<b>Criticality Score:</b>	New asset to be assigned a score of 5 due to the failing state of the Gravity Filters currently in functional failure currently in service.
<b>Recommended Solution:</b>	Installation of a fourth disc filter that will run in parallel with the three already scoped disc filters.

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Measurable Benefits:</b>	Allows for asset life cycle extension of a new asset, as it will allow for maintenance of each of the disc filters. In addition, since the current Gravity Filter is in functional failure.
<b>Basis of Recommendation:</b>	NPDES compliance to meet redundancy needs and asset preservation.
<b>Assumptions / Risks:</b>	Minimal risk, especially if installed concurrently with S1.
<b>Primary Driver:</b>	Asset preservation and process flexibility.
<b>Cost Estimate:</b>	\$350,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Manhole Rehabilitation

<b>Problem or Opportunity:</b>	Manhole rehabilitations are a necessary part of collection system maintenance. Staff continues to perform routine inspections, cleaning and Hot List maintenance using frequent cleaning/jetting as well as extensive monitoring using CCTV. During these tasks manholes are identified for rehabilitation.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	Identify and rehabilitate manholes as normal preventative measures identify the necessity.
<b>Measurable Benefits:</b>	The rehabilitation prevents manhole collapse and street damage
<b>Basis of Recommendation:</b>	Review of manhole inspection data
<b>Assumptions / Risks:</b>	The costs could be reduced by coordination with Public Works prior to their planned street repairs and improvements for greater economies of scale.
<b>Primary Driver:</b>	Asset renewal and prevention of system failures
<b>Cost Estimate:</b>	\$200,000 per year to repeat annually based on findings
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

#### Aged Main Replacement

<b>Problem or Opportunity:</b>	Some sanitary sewer lines are undersized and/or deteriorated and must be replaced to prevent impacts such as further degradation, infiltration, exfiltration, SSOs and potentially private and public property damage.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	The aged main replacement project would address and reduce the number of repeated large emergency breaks. The Baseline Facility Record identifies the main lines that are in critical need of total replacement. This Record is updated each year and as field inspections are conducted and CCTV data is collected and analyzed, annual updates are made accordingly.

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Measurable Benefits:</b>	The reduction of infiltration and exfiltration, correction of damaged and aged sewer lines and ultimately further mitigation of SSOs.
<b>Basis of Recommendation:</b>	Proactive mitigation of risk for unplanned collection system failures. Core benefits include an increase in the collection system's reliability due to improved structural integrity of the pipe.
<b>Assumptions / Risks:</b>	Normal construction risks associated with unknown underground assets. Costs could be reduced by coordinating with Public Works prior to street repairs or improvements.
<b>Primary Driver:</b>	Begin proactive strategic replacement of critical utility infrastructure. Increased reliability to better prevent unplanned failures and overflows.
<b>Cost Estimate:</b>	\$1,000,000 is the estimated annual repair need based on findings using pipe bursting techniques, CCTV and by coordinating street repair improvements with Public Works projects.
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

## FY 2020-2021 Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Plant 5 Secondary Effluent Clarifiers A & B Overhaul	Overhaul need to maintain NPDES Permit Compliance	3	\$500,000
Plant 5 Primary Clarifier Overhaul	Overhaul need to maintain NPDES Permit Compliance	3	\$500,000
Secondary Equalization Basin Inlet Gates Repair	Inability to isolate for cleaning or repairs.	5	\$300,000
Overhaul Headworks, Plant 5	Overhaul needed to maintain process and operational integrity	4	\$250,000
Manhole Replacement and Rehabilitation	PM Inspection	5	\$200,000
Aged Wastewater Main Replacement	History of HOT LIST and past pipe segment replacements	5	\$1,000,000
Total:			\$2,750,000



## FY 2020-2021 Proposed Capital Improvement Project Descriptions

### Plant 5 Secondary Effluent Clarifiers A&B Overhaul

<b>Problem or Opportunity:</b>	The asset is failing and its current poor performance is being stressed by the aeration systems MLSS loading, resulting in the increased risk of violation due to excess suspended solids in the effluent.
<b>Assets Included:</b>	OWAM ID 778/779
<b>Years Remaining Life:</b>	17
<b>Condition Score:</b>	3
<b>Criticality Score:</b>	3
<b>Recommended Solution:</b>	Overhaul of the Secondary Effluent Clarifiers is required to maintain compliance with the NPDES permit.
<b>Basis of Recommendation:</b>	Permit compliance
<b>Assumptions / Risks:</b>	Increased risk of NPDES permits violations.
<b>Primary Driver:</b>	NPDES permit compliance
<b>Cost Estimate:</b>	\$500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

### Plant 5 Primary Clarifier Overhaul

<b>Problem or Opportunity:</b>	The asset is failing and its current poor performance is impacting the stress loading on the aeration system, where.
<b>Assets Included:</b>	OWAM ID 773
<b>Years Remaining Life:</b>	17
<b>Condition Score:</b>	3
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	Overhaul of the Primary Clarifier is required to maintain compliance with the NPDES permit
<b>Basis of Recommendation:</b>	Permit compliance. TIN's are running at 9.8mg/L which is close to the 10.0 mg/l permit limit
<b>Assumptions / Risks:</b>	Increased risk of NPDES permits violations.
<b>Primary Driver:</b>	NPDES permit compliance
<b>Cost Estimate:</b>	\$500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

### Secondary Equalization Basin Inlet Gate Repairs

<b>Problem or Opportunity:</b>	Gates no longer seal, and there is structural degradation. The gates have had in-house repairs, but a more systemic approach will extend asset lifespan and ensure process control.
<b>Assets Included:</b>	OWAM ID 1021
<b>Condition Score:</b>	5

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Criticality Score:</b>	3
<b>Recommended Solution:</b>	Replace the gates and plan for diversion and control
<b>Measurable Benefits:</b>	Flow control and isolation. Asset Preservation and increase in process control capability.
<b>Basis of Recommendation:</b>	Past service life, and asset's inability to isolate and seal; core function of the asset's deliverable.
<b>Assumptions / Risks:</b>	Inability to isolate for cleaning or repairs
<b>Primary Driver:</b>	Failing condition
<b>Cost Estimate:</b>	\$300,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Overhaul of Headworks Plants 5

<b>Problem or Opportunity:</b>	Bar screen is jamming at the bottom and probing indicates something at the bottom causing jam, possibly deteriorated concrete. Unable to determine until drained. At this point there are no suspected issues with the structure itself, but closer examination is needed. A plan to bypass and drain the tank will be developed to determine if structural repairs are needed.
<b>Assets Included:</b>	OWAM ID 744
<b>Condition Score:</b>	4
<b>Criticality Score:</b>	4
<b>Recommended Solution:</b>	Overhaul the bar screen that is jamming at the bottom. Overhaul to fully eliminate structural and mechanical issues.
<b>Measurable Benefits:</b>	Flow control and isolation
<b>Basis of Recommendation:</b>	Preventative Maintenance inspections indicate that the integrity of the Headworks is compromised from a jam occurring at the bottom. Further investigation is needed to determine the impact to the process and operational impact.
<b>Assumptions / Risks:</b>	Inability to isolate for cleaning or repairs
<b>Primary Driver:</b>	Failing condition
<b>Cost Estimate:</b>	\$250,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Manhole Rehabilitation

<b>Problem or Opportunity:</b>	Manhole rehabilitations are a necessary part of collection system maintenance. Staff continues to perform routine inspections, cleaning and Hot List maintenance using frequent cleaning/jetting as well as extensive monitoring using CCTV. During these tasks manholes are identified for rehabilitation.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	Identify and rehabilitate manholes as normal preventative measures identify the necessity.

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Measurable Benefits:</b>	The rehabilitation prevents manhole collapse and street damage
<b>Basis of Recommendation:</b>	Review of manhole inspection data
<b>Assumptions / Risks:</b>	The costs could be reduced by coordination with Public Works prior to their planned street repairs and improvements for greater economies of scale.
<b>Primary Driver:</b>	Asset renewal and prevention of system failures
<b>Cost Estimate:</b>	\$200,000 per year to repeat annually based on findings
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

#### Aged Main Replacement

<b>Problem or Opportunity:</b>	Some sanitary sewer lines are undersized and/or deteriorated and must be replaced to prevent impacts such as further degradation, infiltration, exfiltration, SSOs and potentially private and public property damage.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	The aged main replacement project would address and reduce the number of repeated large emergency breaks. The Baseline Facility Record identifies the main lines that are in critical need of total replacement. This Record is updated each year and as field inspections are conducted and CCTV data is collected and analyzed, annual updates are made accordingly.
<b>Measurable Benefits:</b>	The reduction of infiltration and exfiltration, correction of damaged and aged sewer lines and ultimately further mitigation of SSOs.
<b>Basis of Recommendation:</b>	Proactive mitigation of risk for unplanned collection system failures. Core benefits include an increase in the collection system's reliability due to improved structural integrity of the pipe.
<b>Assumptions / Risks:</b>	Normal construction risks associated with unknown underground assets. Costs could be reduced by coordinating with Public Works prior to street repairs or improvements.
<b>Primary Driver:</b>	Begin proactive strategic replacement of critical utility infrastructure.
<b>Cost Estimate:</b>	Increased reliability to better prevent unplanned failures and overflows. \$1,000,000 is the estimated annual repair need based on findings using pipe bursting techniques, CCTV and by coordinating street repair improvements with Public Works projects.
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

## FY 2021-2022

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Solids Process Improvement	Assets have exceeded their lifespan and process reliability. Project to include process review and improvement.	4.9	\$2,500,000
Plant 5 Aeration Basins Overhaul	Overhaul need to maintain NPDES Permit Compliance	4	\$500,000
Manhole Replacement and Rehabilitation (to be skipped this year for Solids Improvement Project)	Based on PM inspections	5	\$0
Aged Wastewater Main Replacement (to be skipped this year for Solids Improvement Project)	History of HOT LIST and past pipe segment replacements	5	\$0
Total:			\$3,000,000

## FY 2021-2022

# Proposed Capital Improvement Project Descriptions

### Solids Processing Improvements

<b>Problem or Opportunity:</b>	Assets are past the end of its expected service life and the system has been pushed to run continuously as the Belt Press 1, Klampress is non-functional. The system is operated in the lead position except for a small PM window monthly. The system can no longer be overhauled, and must be replaced. Belt Press 1 is in functional failure, and Klampress can only operate in small increments. This project will also include a holistic review of the solids process to select assets that improve the efficiency of solids processing.
<b>Assets Included:</b>	OWAM ID 645 and 646
<b>Condition Score:</b>	4.9 Average
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	Complete overhaul of both of the Belt Presses: structural, electrical and mechanical components. This will also include new structural installation as well as new: piping, instrumentation, valving, pumps, and interconnection with SCADA programming. Assets selected in this project will reflect the results of an exhaustive analysis of current technology to improve solids processing.
<b>Measurable Benefits:</b>	Reliable solids processing, a return to redundancy with the system as well as a potential for increased capacity.
<b>Basis of Recommendation:</b>	Both assets are in functional failure condition and have exceeded the life expectancy.
<b>Assumptions / Risks:</b>	The system is currently out of rotation due to its failing condition, so repairs and replacement would not directly impact the operations.
<b>Primary Driver:</b>	Process control and solids management.
<b>Cost Estimate:</b>	\$2,500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

### Plant 5 Aeration Basin Overhaul

<b>Problem or Opportunity:</b>	As directed by City Council, S1 did not fully fund the completion of the Plant 5 Aeration System Overhaul. The fine bubble diffusers and piping were installed in 2000 and have not been able to be inspected/replaced because of lack of redundant capacity. Originally, it was believed that OR&R could cover the cost of this replacement over a two year period, however; this project is for the remainder of the overhaul not already covered through the allocated OR&R projects. The current Waterfall Funding does not cover this cost.
<b>Assets Included:</b>	OWAM ID 763/764
<b>Years Remaining Life:</b>	Inspection/Overhaul exceeded 13 years; 33 years remaining structurally
<b>Condition Score:</b>	4

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	It is recommended that there is a complete overhaul of the Plant 5 Aeration Basin, including cleaning inspection and repairs. In addition this project allows for an upgrade to the basin, which includes zone isolation, controls, structural baffle modifications, and programming for SCADA.
<b>Basis of Recommendation:</b>	NPDES permit compliance
<b>Assumptions / Risks:</b>	Increased risk of non-compliance
<b>Primary Driver:</b>	NPDES compliance. This project ensures that the design capacity of 11.7 MGD can be achieved with one aeration train in service.
<b>Cost Estimate:</b>	\$500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

## FY 2022-2023 Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
SCADA and Electrical Upgrades to Lift Stations	Lack of SCADA monitoring and controls	N/A	\$1,000,000
Phase I -- Overhaul Gravity Belts	Assets have exceeded their lifespan and process reliability	4	\$800,000
Manhole Replacement and Rehabilitation	PM Inspection	5	\$200,000
Aged Wastewater Main Replacement	History of HOT LIST and past pipe segment replacements	5	\$1,000,000
Total:			<b>\$3,000,000</b>



## FY 2022-2023

### Proposed Capital Improvement Project Descriptions

#### SCADA and Electrical Upgrades to Lift Stations

<b>Problem or Opportunity:</b>	There are no current lift station SCADA monitoring controls.
<b>Assets Included:</b>	Multiple Assets, and asset systems.
<b>Condition Score:</b>	All assets have an average score of 4.46
<b>Criticality Score:</b>	All assets have scored a 5 in criticality
<b>Recommended Solution:</b>	Upgrade existing instrumentation and controls at the Lift Station to allow for automation, remote monitoring and controls via SCADA.
<b>Measurable Benefits:</b>	The increased reliability of monitoring operational aspects at the lift stations.
<b>Basis of Recommendation:</b>	Current lack of remote communication monitoring and controls.
<b>Assumptions / Risks:</b>	The work would require electrical upgrades and coordination with planned SCADA projects.
<b>Primary Driver:</b>	System upgrades, reduction of response time in the event of system failures, and prevention of Sanitary Sewer Overflows.
<b>Cost Estimate:</b>	\$1,000,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Phase I Overhaul of Gravity Belts

<b>Problem or Opportunity:</b>	Assets are past the end of their expected service life and the system has been pushed to run past expected life span. MCC panels are deteriorating and PLC panel and belts are in poor condition. There are structural integrity issues that need to be addressed through the replacement of the entire parallel asset set.
<b>Assets Included:</b>	OWAM ID 649 and 650
<b>Condition Score:</b>	4
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	It is recommended that there is a complete overhaul/replacement of both of the Gravity Belts, including structural, electrical, controls, and mechanical components. This will be a two phase approach, overhaul/replacing one Gravity Belt at a time.
<b>Measurable Benefits:</b>	Redundancy within the system to ensure operational capacity and process control.
<b>Basis of Recommendation:</b>	The asset's current condition has exceeded its life expectancy
<b>Assumptions / Risks:</b>	Neither of the Gravity Belts are being addressed in S1, and both have exceeded their expected lifespan and the system requires a parallel overhaul/replacement plan.
<b>Primary Driver:</b>	The need for this asset pair to be able to run to capacity per NPDES permit. Need for alternative backup and operational redundancy.
<b>Cost Estimate:</b>	\$800,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..



#### Manhole Rehabilitation

<b>Problem or Opportunity:</b>	Manhole rehabilitations are a necessary part of collection system maintenance. Staff continues to perform routine inspections, cleaning and Hot List maintenance using frequent cleaning/jetting as well as extensive monitoring using CCTV. During these tasks manholes are identified for rehabilitation.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	Identify and rehabilitate manholes as normal preventative measures identify the necessity.
<b>Measurable Benefits:</b>	The rehabilitation prevents manhole collapse and street damage
<b>Basis of Recommendation:</b>	Review of manhole inspection data
<b>Assumptions / Risks:</b>	The costs could be reduced by coordination with Public Works prior to their planned street repairs and improvements for greater economies of scale.
<b>Primary Driver:</b>	Asset renewal and prevention of system failures
<b>Cost Estimate:</b>	\$200,000 per year to repeat annually based on findings
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

#### Aged Main Replacement

<b>Problem or Opportunity:</b>	Some sanitary sewer lines are undersized and/or deteriorated and must be replaced to prevent impacts such as further degradation, infiltration, exfiltration, SSOs and potentially private and public property damage.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	The aged main replacement project would address and reduce the number of repeated large emergency breaks. The Baseline Facility Record identifies the main lines that are in critical need of total replacement. This Record is updated each year and as field inspections are conducted and CCTV data is collected and analyzed, annual updates are made accordingly.
<b>Measurable Benefits:</b>	The reduction of infiltration and exfiltration, correction of damaged and aged sewer lines and ultimately further mitigation of SSOs.
<b>Basis of Recommendation:</b>	Proactive mitigation of risk for unplanned collection system failures. Core benefits include an increase in the collection system's reliability due to improved structural integrity of the pipe.
<b>Assumptions / Risks:</b>	Normal construction risks associated with unknown underground assets. Costs could be reduced by coordinating with Public Works prior to street repairs or improvements.

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Primary Driver:</b>	Begin proactive strategic replacement of critical utility infrastructure. Increased reliability to better prevent unplanned failures and overflows.
<b>Cost Estimate:</b>	\$1,000,000 is the estimated annual repair need based on findings using pipe bursting techniques, CCTV and by coordinating street repair improvements with Public Works projects.
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

## FY 2023-2024

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
Phase II -- Overhaul Gravity Belts	Assets have exceeded their lifespan and process reliability	4	\$800,000
Repair/Replacement of Old Blowers	PM Inspection and known load capacity that is shortening asset life	4.5	\$550,000
Digester 2 Dystor Cover Overhaul	Dystor Cover has a ten year life expectancy, and has currently reached its tenth year. Requires an overhaul.	4	\$250,000
Manhole Replacement and Rehabilitation	PM Inspection and CCTV	5	\$200,000
Aged Sewer Main Replacement	History of HOT LIST and past pipe segment replacements	5	\$1,000,000
Total:			<b>\$2,800,000</b>

## FY 2023-2024

### Proposed Capital Improvement Project Descriptions

#### Phase II Overhaul of Gravity Belts

<b>Problem or Opportunity:</b>	Assets are past the end of their expected service life and the system has been pushed to run past expected life span. MCC panels are deteriorating and PLC panel and belts are in poor condition. There are structural integrity issues that need to be addressed through the replacement of the entire parallel asset set.
<b>Assets Included:</b>	OWAM ID 649 and 650
<b>Condition Score:</b>	4
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	It is recommended that there is a complete overhaul/replacement of both of the Gravity Belts, including structural, electrical, controls, and mechanical components. This will be a two phase approach, overhaul/replacing one Gravity Belt at a time.
<b>Measurable Benefits:</b>	Redundancy within the system to ensure operational capacity and process control.
<b>Basis of Recommendation:</b>	The asset's current condition has exceeded its life expectancy
<b>Assumptions / Risks:</b>	Neither of the Gravity Belts are being addressed in S1, and both have exceeded their expected lifespan and the system requires a parallel overhaul/replacement plan.
<b>Primary Driver:</b>	The need for this asset pair to be able to run to capacity per NPDES permit. Need for alternative backup and operational redundancy.
<b>Cost Estimate:</b>	\$800,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Repair/Replacement of Pre S1 (Old) Blowers

<b>Problem or Opportunity:</b>	These blowers and their respective VFDs have degraded and are in a corrosive environment that causes intermittent high temperature load failures. This prevents remote controls and remote monitoring including prohibiting alarms from notifying operations when systems fail. The Blower FLU has become compromised and requires an increased need for manual monitoring and interventions.
<b>Assets Included:</b>	Multiple
<b>Condition Score:</b>	4.5
<b>Criticality Score:</b>	4
<b>Recommended Solution:</b>	Overhaul and rebuild of both blowers and VFDs along with the replacement of electrical and control components. Current cost analysis is dependent on OEM inspection and repair/replacement recommendations.
<b>Measurable Benefits:</b>	Consistent air supply throughout the plant which is used to supply all essential process operations, especially aeration control and consistency.

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Basis of Recommendation:</b>	Due to the leaks within plant piping there has been an excessive load on the blowers due to significant underground plant air piping leaks. These leaks basically require the blowers to be run at full capacity. This is increasing wear and tear, shortening the asset life.
<b>Assumptions / Risks:</b>	The blowers are currently needed to run at full capacity all the time. In order to rebuild them, a manifold will have to be created for a temporary blower install while repairs are made.
<b>Primary Driver:</b>	Asset renewal, prevention of system failures and NPDES permit violations.
<b>Cost Estimate:</b>	\$550,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Digester 2 Dystor Cover Overhaul

<b>Problem or Opportunity:</b>	Asset is past the end of its expected service. MCC panels are deteriorating; the PLC panel and belt are in poor condition. The asset has exceeded its designed lifecycle and is in need of replacement.
<b>Assets Included:</b>	OWAM ID 271, 26, 544, 545, 635, 881, 1237, 1238, 782
<b>Condition Score:</b>	4
<b>Criticality Score:</b>	4
<b>Recommended Solution:</b>	Complete an inspection and overhaul of the entire Digester 2 Dystor including structural, electrical, controls and mechanical components.
<b>Measurable Benefits:</b>	Redundancy within the system as required for operational capacity.
<b>Basis of Recommendation:</b>	The asset's current condition has exceeded the overhaul/replacement period of 10 years.
<b>Assumptions / Risks:</b>	This work has to be scheduled after the other digester has been fully repaired.
<b>Primary Driver:</b>	Need this asset to be able to run at full capacity to meet NPDES permit limits.
<b>Cost Estimate:</b>	\$250,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

#### Manhole Rehabilitation

<b>Problem or Opportunity:</b>	Manhole rehabilitations are a necessary part of collection system maintenance. Staff continues to perform routine inspections, cleaning and Hot List maintenance using frequent cleaning/jetting as well as extensive monitoring using CCTV. During these tasks manholes are identified for rehabilitation.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	Identify and rehabilitate manholes as normal preventative measures identify the necessity.
<b>Measurable Benefits:</b>	The rehabilitation prevents manhole collapse and street damage
<b>Basis of Recommendation:</b>	Review of manhole inspection data

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Assumptions / Risks:</b>	The costs could be reduced by coordination with Public Works prior to their planned street repairs and improvements for greater economies of scale.
<b>Primary Driver:</b>	Asset renewal and prevention of system failures
<b>Cost Estimate:</b>	\$200,000 per year to repeat annually based on findings
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..

#### Aged Main Replacement

<b>Problem or Opportunity:</b>	Some sanitary sewer lines are undersized and/or deteriorated and must be replaced to prevent impacts such as further degradation, infiltration, exfiltration, SSOs and potentially private and public property damage.
<b>Assets Included:</b>	Multiple assets as determined by Preventative Maintenance activities.
<b>Condition Score:</b>	Those scoring in the poorest condition based on CCTV will be selected.
<b>Criticality Score:</b>	Those which have the highest criticality and poorest condition will be selected, based on inspections.
<b>Recommended Solution:</b>	The aged main replacement project would address and reduce the number of repeated large emergency breaks. The Baseline Facility Record identifies the main lines that are in critical need of total replacement. This Record is updated each year and as field inspections are conducted and CCTV data is collected and analyzed, annual updates are made accordingly.
<b>Measurable Benefits:</b>	The reduction of infiltration and exfiltration, correction of damaged and aged sewer lines and ultimately further mitigation of SSOs.
<b>Basis of Recommendation:</b>	Proactive mitigation of risk for unplanned collection system failures. Core benefits include an increase in the collection system's reliability due to improved structural integrity of the pipe.
<b>Assumptions / Risks:</b>	Normal construction risks associated with unknown underground assets. Costs could be reduced by coordinating with Public Works prior to street repairs or improvements.
<b>Primary Driver:</b>	Begin proactive strategic replacement of critical utility infrastructure.
<b>Cost Estimate:</b>	Increased reliability to better prevent unplanned failures and overflows. \$1,000,000 is the estimated annual repair need based on findings using pipe bursting techniques, CCTV and by coordinating street repair improvements with Public Works projects.
<b>Method of Delivery:</b>	Inspections in house and repairs by Third party installation under Veolia's direction and management..



## FY 2024-2029

### Summary of Proposed Capital Improvement Projects

Asset Description	Decision	Condition Rank	Estimated Cost
SCADA Communication Link and SCADA Upgrades	Replacement of Obsolete phone lines and increased reliability and speed	5	\$1,500,000
Flare and Biogas System Modifications	Permit Compliance for SCAQMD 1118.1 Rule	3.2	\$3,000,000
Electrical Switchover from Plants 1-4 to Centralization in Plant 5	Centralization of electrical assets, replacement of aged assets	4.5	\$1,250,000
Wastewater Site Security Upgrades	Enhanced reliability, asset preservation, and theft deterrence	TBD	\$500,000
Chlorine Contact Tanks Water Valve Replacement	Valves in a failed state, but in the operational position necessary	5	\$175,000
Effluent Gravity Filter Structural Rehabilitation, Valve and Anthracite Replacement	Structural integrity of the asset is compromised as it is 20 years past it's useful life	4.5	\$750,000
Secondary EQ Influent Filter Pump 1, 2, and 3 Overhaul and VFD Replacements	Assets have exceeded life expectancy and have reduced operational efficiency	4	\$3,500,000
Digester 1 Dystor Cover Overhaul	Dystor Cover has a ten year life expectancy, and has currently reached its tenth year, requiring inspection and repair/overhaul.	4	\$250,000
<b>Total:</b>			<b>\$10,925,000</b>

## FY 2024-2029

# Proposed Capital Improvement Project Descriptions

### SCADA Communication Link and SCADA Upgrades

<b>Problem or Opportunity:</b>	This project is for the installation of fiber optic and 5G internet connectivity. This will allow for remote monitoring and control of the wastewater process through SCADA, as well as enhanced reliability of the plant's communication systems.
<b>Assets Included:</b>	Multiple assets
<b>Condition Score:</b>	4.5
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	The recommended solution is to install fiber optic communication lines, and allow for redundancy through 5G connectivity.
<b>Measurable Benefits:</b>	Reliable communication networks throughout the wastewater processes.
<b>Basis of Recommendation:</b>	Currently the plant is running on obsolete copper phone lines that prevent remote monitoring and control of wastewater systems. The introduction of S1 will allow for technological advances in control, but require reliable and faster internet connectivity.
<b>Assumptions / Risks:</b>	The risk results only if we fail to replace the obsolete phone lines.
<b>Primary Driver:</b>	Increased reliability and reduction of in planned failures.
<b>Cost Estimate:</b>	\$1,500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management.

### Flare and Biogas System Modifications

<b>Problem or Opportunity:</b>	This project is for the modification of the Flare and Biogas in order to remain compliant to proposed regulation SCAQMD 1118.1. There are currently two flares: one that has exceeded life span by 14 years and is a candlestick model and the other flare has eight years of mechanical life. In the proposed regulation, candlestick flares are no longer compliant and require retirement/replacement.
<b>Assets Included:</b>	Multiple assets as determined by permit compliance.
<b>Condition Score:</b>	5
<b>Criticality Score:</b>	3
<b>Recommended Solution:</b>	The recommended solution is the retirement and replacement of the candlestick flare. After the replacement of the candlestick flare, an overhaul of the remaining zinc flare system will follow.
<b>Measurable Benefits:</b>	Compliance to SCAQMD 1118.1 Rules
<b>Basis of Recommendation:</b>	Regulation compliance and asset preservation and lifecycle extension.
<b>Assumptions / Risks:</b>	During the replacement of the candlestick flare, there will not be redundancy for flaring.
<b>Primary Driver:</b>	Compliance, increased reliability, and prevention of unplanned failures.
<b>Cost Estimate:</b>	\$3,000,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..



**Electrical Switchover from Plants 1-4 to Centralization in Plant 5**

<b>Problem or Opportunity:</b>	This project is for the electrical rework in order to consolidate all electrical systems to Plant 5, away from Plants 1-4.
<b>Assets Included:</b>	Multiple assets
<b>Condition Score:</b>	4.5 is the average of all assets
<b>Criticality Score:</b>	5 based on lack of redundancy
<b>Recommended Solution:</b>	The recommended solution is to centralize all electrical assets, to allow for ease in troubleshooting, and successful utilization of backup systems in the event of a power outage. This will also allow for the replacement of electrical assets that have far outlived their useful life.
<b>Measurable Benefits:</b>	The benefits include enhanced reliability with new wiring and electrical systems centrally located for maintenance and troubleshooting.
<b>Basis of Recommendation:</b>	Enhanced reliability, asset preservation, and multiple assets aging beyond lifecycle expectations.
<b>Assumptions / Risks:</b>	Minimal risk, as Veolia will coordinate phased modifications.
<b>Primary Driver:</b>	Completion of S1
<b>Cost Estimate:</b>	\$1,250,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

**Wastewater Treatment Plant Site Security Upgrades**

<b>Problem or Opportunity:</b>	This project is for site security measures for the entire wastewater treatment plant. The scope of the project is to include: intrusion detection systems, audio and visual alarms, LED facility lighting, camera's, and automatic security callouts.
<b>Assets Included:</b>	Multiple assets
<b>Condition Score:</b>	There is currently no site security.
<b>Criticality Score:</b>	The plant has suffered frequent vandalisms and thefts.
<b>Recommended Solution:</b>	The recommended solution is to create a site security program to include multiple aspects of remote monitoring, and theft deterrence.
<b>Measurable Benefits:</b>	The benefits include security of valuable assets, and uninterrupted treatment at the plant.
<b>Basis of Recommendation:</b>	Enhanced reliability, asset preservation, and theft deterrence.
<b>Assumptions / Risks:</b>	Minimal risk, as Veolia will coordinate phased modifications.
<b>Primary Driver:</b>	Completion of S1
<b>Cost Estimate:</b>	\$500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management..

**CCT Utility Water Valve Replacement**

<b>Problem or Opportunity:</b>	Two valves are seized rendering them incapable of isolation. One valve requires that it remain operationally open, and the other closed; both are frozen in position.
<b>Assets Included:</b>	768
<b>Condition Score:</b>	4.5
<b>Criticality Score:</b>	5

## 2019 - 2023 Capital Plan

### Rialto Wastewater Facilities

---

<b>Recommended Solution:</b>	The recommended solution is to replace the valves which would require excavation to the asset's underground location.
<b>Measurable Benefits:</b>	Process control and isolation capability restores.
<b>Basis of Recommendation:</b>	The east valve is seized open and the west is seized in the closed position which leaves the valves in operable, thus preventing ability to clean the CCT structures.
<b>Assumptions / Risks:</b>	Inability to isolate for cleaning or repairs. The work may require downstream process to temporarily halt during actual valve replacement, but no variance would be required as long as the actual replacement was completed within 12 hours.
<b>Primary Driver:</b>	Failed condition and inability to access underground assets underground assets easily for repair.
<b>Cost Estimate:</b>	\$175,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management.

### Effluent Gravity Filter Structural Rehabilitation, Valve and Anthracite Replacement

<b>Problem or Opportunity:</b>	Multiple filters are in a failed state, as they are almost twenty years past their life. Valves are in need of replacement, and structural overhaul is required to allow this filter to run in parallel to new system. Having redundancy will allow for asset preservation for the new assets, and allow for continued flexibility in the process.
<b>Assets Included:</b>	OWAM ID 750
<b>Condition Score:</b>	4
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	Replace the anthracite in remaining filters that have not yet been overhauled. This includes the rehabilitation of the physical structure of the vessels including inspection and repairs of the seams, seals, and recoating of the vessel. Once the vessel has been rehabilitated, the newly purchase anthracite can be preserved in the vessel. This project includes the rehabilitation or replacement of the valves, and or actuators. The rehabilitation or replacement of the valves and or actuators would require a variance for zero flow discharge. Due to the regulatory impact of the valve/actuator work, it is recommended that all 50 valves are planned systematically after the completion of S1.
<b>Measurable Benefits:</b>	Compliance with state's NPDES requirements
<b>Basis of Recommendation:</b>	Filter's anthracite is being lost due to physical structure degradation. The process is currently running at an increased risk for NPDES permit violation.
<b>Assumptions / Risks:</b>	Inability to utilize all eight filters as required and as designed.
<b>Primary Driver:</b>	Failing condition and increased risks of violations.
<b>Cost Estimate:</b>	\$750,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management.

**Secondary EQ Influent Filter Pump 1, 2, and 3 Overhaul and VFD Replacements**

<b>Problem or Opportunity:</b>	The pumping system has exceeded its life expectancy by fifteen years, and the mechanical and electrical equipment is aged. Each of the pumps need to be overhauled to extend asset life. One of the motors has had an issue with vibration, and it has been noticed that the mounting pedestal is showing cracking. This pump will have to have a new pedestal during its overhaul rotation.
<b>Assets Included:</b>	Multiple Assets
<b>Condition Score:</b>	4 Worse Condition of Asset Group
<b>Criticality Score:</b>	5
<b>Recommended Solution:</b>	The recommendation includes the overhaul of all the secondary EQ Influent Filter Pumps in rotation. The project is to include the replacement of the Secondary EQ Basin/Pumping System including VFD replacement and integration into SCADA process control system. The pumping system also requires the replacement of the pedestals and the pump mountings.
<b>Measurable Benefits:</b>	Compliance with state's NPDES requirements and redundancy requirements.
<b>Basis of Recommendation:</b>	The mechanical and electrical equipment is aged, and worn, and not operating efficiently.
<b>Assumptions / Risks:</b>	Inability to utilize all eight filters as required and as designed.
<b>Primary Driver:</b>	Failing condition and increased risks of violations.
<b>Cost Estimate:</b>	\$3,500,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management.

**Digester 1 Dystor Cover Overhaul**

<b>Problem or Opportunity:</b>	Asset is past the end of its expected service. MCC panels are deteriorating; the PLC panel and belt are in poor condition. The asset has exceeded its designed lifecycle and is in need of replacement.
<b>Assets Included:</b>	OWAM ID 781
<b>Condition Score:</b>	3
<b>Criticality Score:</b>	4
<b>Recommended Solution:</b>	Complete an inspection and overhaul of the entire Digester 1 Dystor including structural, electrical, controls and mechanical components.
<b>Measurable Benefits:</b>	Redundancy within the system as required for operational capacity.
<b>Basis of Recommendation:</b>	The life expectancy for a digester lid is ten years. The Dystor was replaced in 2016 and 2026 will be its ten year replacement marker.
<b>Assumptions / Risks:</b>	This work has to be scheduled after the other digester has been fully repaired.
<b>Primary Driver:</b>	Need this asset to be able to run at full capacity to meet NPDES permit limits.
<b>Cost Estimate:</b>	\$250,000
<b>Method of Delivery:</b>	Third party installation under Veolia's direction and management.



### **3. CONCLUSION**

The Asset Management program coupled with field data collected by the operations team are utilized to develop these CIP recommendations and proposed schedules. To date, no funding mechanism has been put in place by the City to move any of these projects forward. RWS understands that City staff is working with City Council to review and set rates necessary to proactively complete as many of these important Capital projects and possible. Veolia has separately completed an infrastructure value analysis which makes typical replacement recommendations based on actual Rialto conditions.



# Buffalo Monthly Water Board Report

Contract Year 10 – July 2019



Remove Old Lead Lines (ROLL): Grant Funded pilot program to replace leaking lead service lines.



# Water Board Report

Contract Year 10 – July 2019

## Buffalo Water Board

*Chairperson:* Oluwole A. McFoy, P.E.

*Vice Chairperson:* William L. Sunderlin

*Member:* Gerald E. Kelly

*Member:* Steve Stepniak

## City of Buffalo

*Commissioner of Public Works:* Michael J. Finn, P.E.

*City Engineer:* Michael J. Finn, P.E.

*Principal Engineer:* Peter J. Merlo, P.E.  
John D. McMahon, P.E.

## Table of contents

### Summary of System Operations

- Summary of Service Revenues and Charges
- Meter Reading & Billing
- Metering
- Customer Service
- Distribution
- Field Services
- Plant Operations
- Safety & Environmental

### Communications

### Current Staffing

### Performance Standards

### Appendix:

- Raw and Treated Water Quality, Water Quality Summary
- Water Usage Summary
- Distribution Department Report
- Energy Usage
- Motor Vehicle Accidents & Personal Injuries
- Work Order Summary

**Veolia Management**

- Project Manager**  
Mr. David Hill, IA, IB, C  
(270) 570-3040
- Operations Manager**  
Mr. Douglas Fultz, PE, IIA  
(716) 262-6627
- Technical Manager**  
Mr. Michael R. Carson  
(716) 388-7992
- Asset Manager**  
Mr. Ryan Hoople  
(716) 560-4283
- Customer Service Manager**  
Mr. Diamond Rand  
(716) 242-8800
- Billing Manager**  
Mr. Damon A. Sykes, MBA  
(716) 536-4752

## Summary of System Operations

### Summary of Service Revenues & Charges

July, 2019 is the first month of Contract Year 10. Actual revenues were reported at \$3,751,370 against the budgeted amount of \$3,742,879. Year over year revenues for July came in at \$3.7513 million vs \$2.834 million; this represents a 32.33% increase for the same reporting period last year. For the first month of this new fiscal year period, revenues are \$916,457 greater than they were last year. Please note the summary of revenues on page 23 and graph on page 25.

Charges for the month were \$4.279 million versus \$3.533 million last year, an increase in billed charges of 21.13% percent from last July. For the first month of the new fiscal year, charges have improved by \$746,427 from last year.

Finished water production for the month was 2.18BG verses 2.24BG last year. (Please see page 31)

### Meter Reading & Billing

Quarterly billing cycle 2000 group was read during the month of July. A total of 24,352 quarterly meters are in the billing cycle of which 22,924 obtained an actual reading. Estimated readings were performed for 1,428 meters. This resulted in a 94.1% success rate in obtaining actual reads. For the 984 monthly metered accounts we received actual reads on 946 meters. Over the past twelve months the number of estimated reads has averaged 1,408 or 6.6% of the total accounts with quarterly meters.

### Metering

Within the Buffalo Water service territory, the current number of accounts being billed on a flat rate stands at 8,213. Out of a total of 64,865 metered accounts, 15,591 have a register with a radio device attached or approximately 23.6% of meters have a radio attached. There is also 1,282 fire supply accounts billed each quarter based on their respective connection size. We will continue to convert flat billed accounts to metered accounts and we will continue to increase the radio population to ensure continued improvement in billing accuracy and revenue generation. The existing maintenance program to repair inoperable meters effectively maintains current levels consistently around 6% of meter population within the service territory.

## Customer Service

During the month of the July we successfully converted the Buffalo Water website onto the Veolia network. Historically the site was hosted by Algonquin Studios who was a longstanding partner of Buffalo Water and Veolia since 2010. This migration onto the Veolia's platform will give us the ability to create and advance the website well beyond its current state.

On July 1, 2019 the first shipment of meters were delivered to Tribus Services out of New Jersey for bench-testing. This is the start of what we hope to be a longstanding partnership that will fulfill our meter testing needs in the future.

## Distribution

Distribution activity included 20 hydrant repairs with 13 new hydrants being installed. There were 33 main breaks in July with 35 repaired during the month. For delinquency turn-offs, 266 accounts were shut off for nonpayment. Another 137 accounts were identified for turn-off, but the turn-off was not performed due to inaccessible and non-working customer owned curb stop valves. During this past month, we issued 3,505 disconnect warning notices to customers that have fallen behind of their payments.

## Field Services

The Remove Old Lead Lines (ROLL) program has successfully started this month with 35 customer service locations benefiting with new service lines to their homes. Customers that have leaking water service lines to their homes are calling Buffalo Water to have their lines replaced, however, under the ROLL program customers are receiving the dual benefit of having their old lead lines removed at the same time new copper lines are used to eliminate the leaking service. The picture on the front cover of this report is one of the service locations that have benefited from the ROLL program.

## Communications

Weekly meetings were held every week during July with management, supervisory, and engineering staff. The meetings provide an open forum for discussion among each business unit of the operation. Open communication is critical to our successful partnership.

## Plant Operations

Residuals processing operations continued through July. The North basin is nearly clean and will be placed back into service at the end of August.

Conducted safety meeting and discussed plant flow coordination with Hohl and GHD for the inlet screen replacement work.

During July meetings have taken place with GHD to discuss upcoming generator testing sequence.

## Safety and Environmental

Buffalo Water employees have completed LO/TO Training

Arc Flash Initial NFPA 70E training and Ladder Safety has been scheduled for August, 2019.

## Staffing

Active staffing is at 108 employees in June for payroll period ending July 28, 2019.

Title	Budgeted	Filled (Permanent)	Acting in Another Position	Budgeted Vacancies	Union
Administrative Services					
Account Clerk Typist	12	11	0	1	650
Water Service Adjuster	1	1	0	0	650
Senior Data Processing Equipment Operator	2	2	0	0	650
Teller	2	2	0	0	650
Inspection and Meter Reading					
Water Service Inspector	2	1	0	1	264
Meter Reader	5	5	0	0	264
Repair and Installation of Meters					
Water Meter Mechanic Supervisor I	1	1	0	0	264
Water Meter Mechanic	8	6	0	2	264

Title	Budgeted	Filled (Permanent)	Acting in Another Position	Budgeted Vacancies	Union
<b>Filtration Plant</b>					
<b>Water Treatment Supervisor</b>	1	1	0	0	<b>650</b>
<b>Filtration Plant Maintenance Supervisor I</b>	1	1	0	0	<b>264</b>
<b>Filtration Plant Operator</b>	4	3	0	1	<b>264</b>
<b>Assistant Filtration Plant Operator</b>	4	3	0	1	<b>264</b>
<b>Chemist</b>	2	2	0	0	<b>650</b>
<b>Associate Chemist</b>	1	0	0	1	<b>650</b>
<b>Intake</b>					
<b>Pumping Plant Superintendent</b>	1	1	0	0	<b>17</b>
<b>Chief Pumping Plant Engineer</b>	4	2	0	2	<b>17</b>
<b>Pumping Plant Operator</b>	4	4	0	0	<b>17</b>
<b>Senior 1st Class Stationary Engineer</b>	1	1	0	0	<b>17</b>
<b>Maintenance Assistant Water</b>	8	6	0	2	<b>17</b>
<b>Stock Clerk</b>	2	2	0	0	<b>650</b>
<b>Laborer II (Water)</b>	1	1	0	0	<b>264</b>



Title	Budgeted	Filled (Permanent)	Acting in Another Position	Budgeted Vacancies	Union
Distribution					
Water Distribution Superintendent	1	1	0	0	650
Assistant Water Distribution Superintendent	2	2	0	0	650
Caulker Supervisor	6	5	0	1	264T
Caulker*	31	25	0	6	264T
Heavy Equipment Operator (Water)	4	3	0	1	264
Senior Engineer Aide	1	1	0	0	650
Chief Dispatcher	1	0	0	1	264
Dispatcher (Water)	5	5	0	0	264
Water Service Worker	5	4	0	1	264
Account Clerk Typist	2	2	0	0	650
Chief Water Pollution Inspector	1	1	0	0	264
GIS Specialist	1	0	0	1	264

Title	Budgeted	Filled (Permanent)	Acting in Another Position	Budgeted Vacancies	Union
Mechanical Services					
Electrician (Water)	1	1	0	0	264
General Mechanic (Water)	3	2	0	1	264

<b>Operating Agreement Positions:</b>	114
<b>Total Positions Filled:</b>	108
<b>Number of Acting Positions:</b>	0
<b>Difference from Agreement:</b>	6

## Performance Standards

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
WATER DISTRIBUTION					
Hydrant Painting	Forty-percent of the System hydrants shall be painted every 2 contract years, such that all hydrants are painted at least once every 5 contract years.	End of every even contract year	X		

### CONTRACT YEAR 9

Performance Standards	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19
WATER DISTRIBUTION												
Monthly Target	263	263	263	0	0	0	0	0	0	263	263	263
Hydrant Painting	11	11	17	8	11	10	21	19	28	27	20	18
Variance:	4.18%	4.18%	6.46%							10.27%	7.60%	6.84%

### CONTRACT YEAR 10

Performance Standards	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
WATER DISTRIBUTION												
Monthly Target	263	263	263	0	0	0	0	0	0	263	263	263
Hydrant Painting	9											
Variance:	3.42%	0.00%	0.00%							0.00%	0.00%	0.00%
Total:												3,156
												210
												6.65%

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
<b>MAINTENANCE</b>					
Maintenance Reporting	Provide the Water Board full documentation evidencing that all Maintenance and preventive Maintenance is performed on all Water Board owned or leased Equipment. An additional report identifying critical spare parts inventory will be made available.	Monthly - Commencing on 02/01/2011. Due the 10th business day of each month.	x		
<b>WATER PRODUCTION</b>					
Water Production Asset Documentation	Catalog, maintain and update record drawings of the system with GIS, CMMS and InfoNet.	Ongoing		x	
Instrument Calibration	Calibrate all pump station flow meters, storage tank level indicators, chart recorders and other instrumentation.	Annually		x	
Water Storage Tank Inspection	Visually inspect the exterior of each elevated storage tank.	Monthly	x		
Pump Station Inspection	Inspect remote pump stations to confirm proper pump, motor, heating/ventilation and instrumentation operation at least once per week.	Weekly	x		
System Filters	Media depth verification of each filter and recommendations to the Water Board for media top up as required.	Annually		x	
	Filter coring and determination of the effective size and uniformity coefficient of the anthracite media contained in not less than 4 filters every contract year.	Annually	x		
	Visual inspection of each filter, including filter coring to inspect for mud balls and assess filter condition.	Annually	x		
General Building Maintenance	Conduct building maintenance so that all offices, restrooms and public areas are aesthetically attractive and in clean condition.	Ongoing	x		
General Grounds Maintenance	Maintain the grounds around water facilities so that areas are aesthetically attractive and in clean condition.	Ongoing	x		

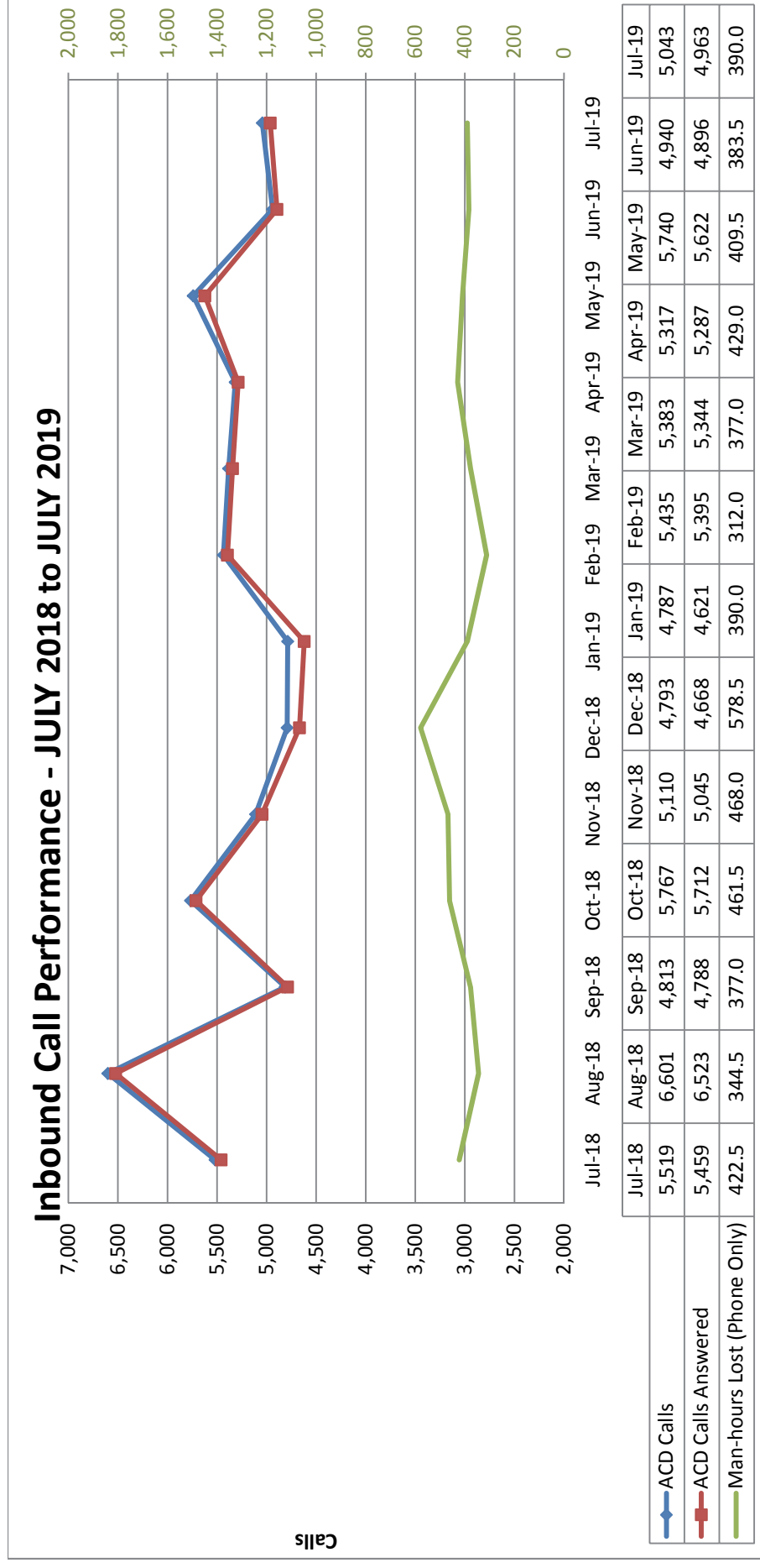
Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
CUSTOMER SERVICE					
Written Correspondence	Respond in writing or by documented phone contact to 100% of all written correspondence within a maximum of 10 business days.	Monthly 07/01/2011	x		

Performance Standards	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
CUSTOMER SERVICE												
Written Correspondence	78	102	106	89	63	103	71	87	62	56	47	44
Response Within 10 Business Days	78	102	106	89	63	103	71	87	62	56	47	44
Response Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
Customer Service Call Answering	Answer at least 90% of all customer service calls within 1 minute or less.	Monthly 07/01/2013		x	
Customer Service Voice Messages	Beginning on or before Contract Year 3, callers remaining on hold for more than 2 minutes will have the option to leave a voice message.	Monthly 07/01/2012	x		
	Veolia shall contact all customers that leave voice messages within 8 business hours of the message and shall note the time and substance of the contact in the customer's billing record.	Ongoing	x		

Performance Standards	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Customer Service Voice Messages												
Number of Voice Messages	36	25	55	65	125	106	48	32	27	63	29	58
Number of Voice Messages Responded to Within 8 business hours	11	6	16	27	48	32	17	18	11	39	18	22
Number of Voice Message Hang Ups	25	19	39	38	77	74	31	14	16	24	11	36
Inbound Call Report												
311 Inquires	129	162	146	93	77	88	90	92	118	97	114	135
Email Inquiries	273	391	410	378	265	257	246	231	248	223	258	271

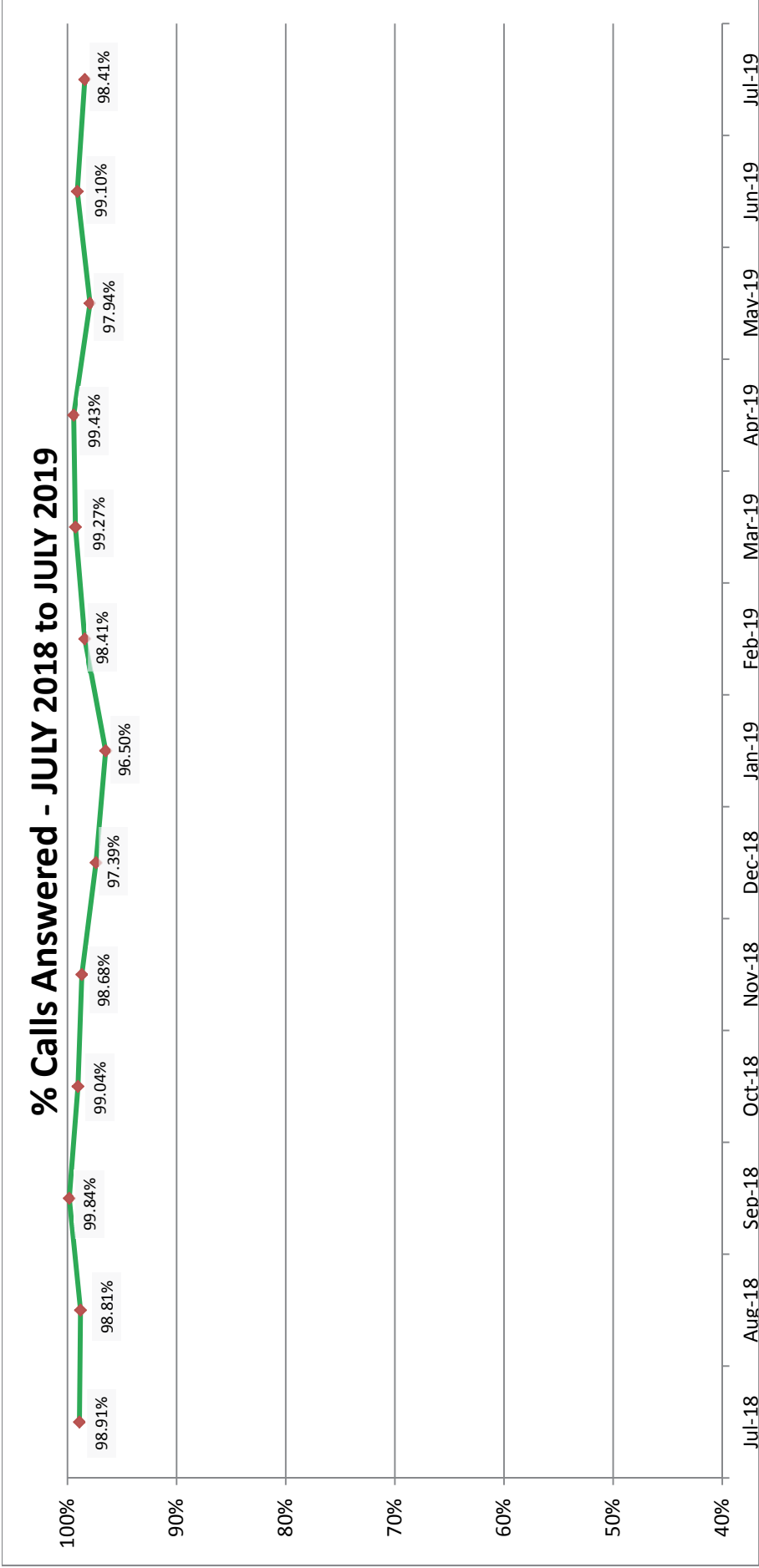
**CALL ANSWERING PERFORMANCE SUMMARY:**



**Figure 1:** Inbound call performance from July, 2018 –July, 2019.

Incoming calls totaled 5,043 and of those 4,963 calls were answered. Incoming call volumes average 5,327 per month over the last 12 months. July incoming call volumes were 5 percent lower than the monthly average. Calls volumes in July are typical for the season. Also, inquires for final billing before change of property ownership.

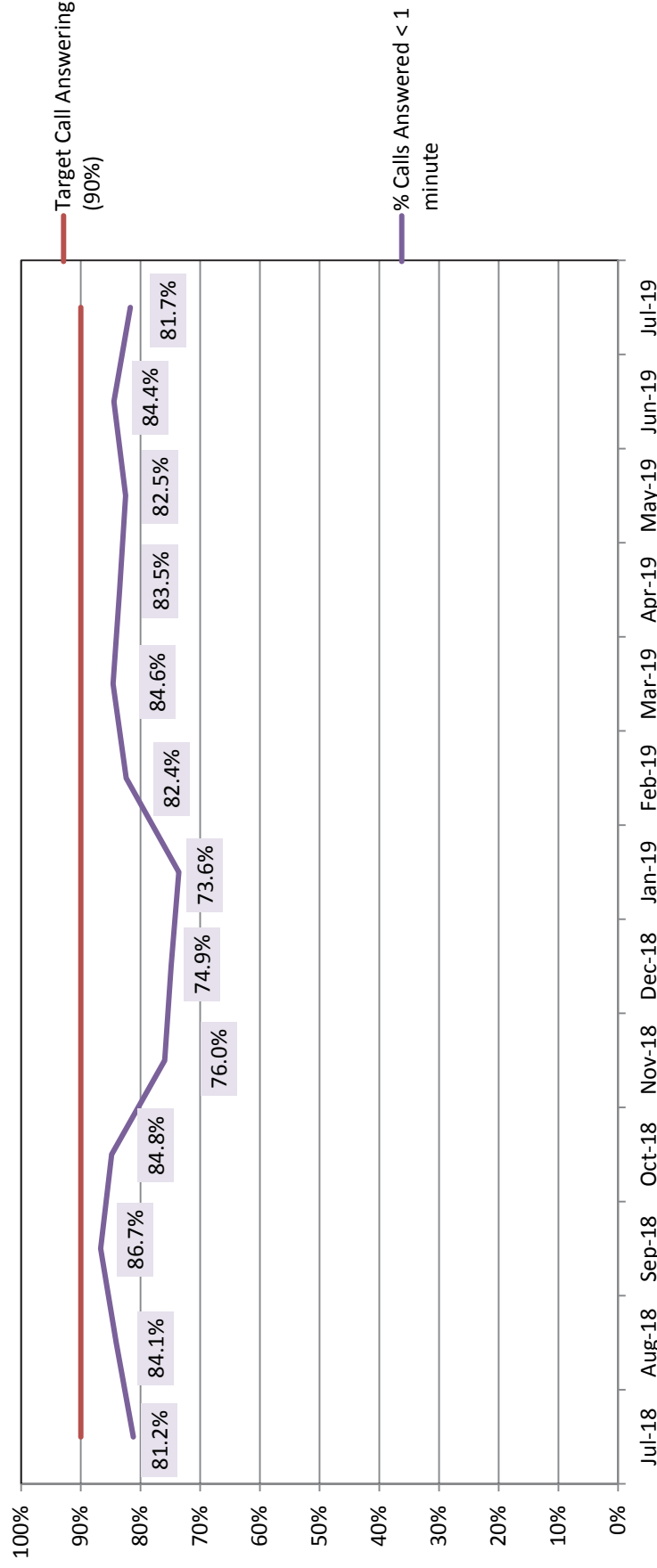




**Figure 2:** Total percent of calls answered from July, 2018 – July, 2019.

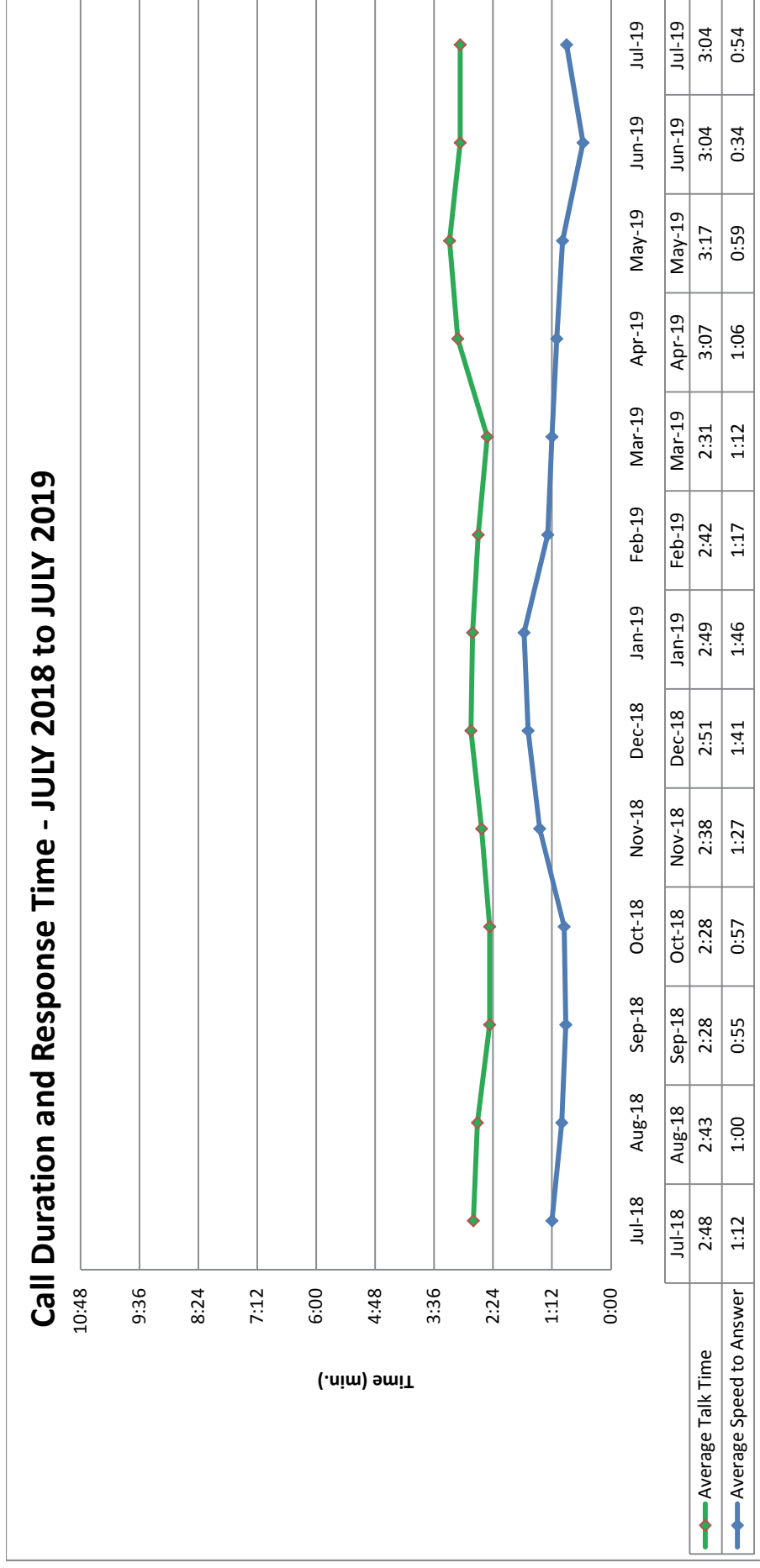
The percentage of calls answered in July finished at 98.41%. 80 calls were abandoned by customers in July which is higher compared to the overall averages calls abandoned of 72 per month over the last 12 months.

### % Calls Answered < 1 Minute (JULY 2018 - JULY 2019)



**Figure 3:** Performance metric for percent of calls answered in less than 1 minute from July 2018 –July 2019.

Calls answered in less than one minute decreased in July to 81.7%. The numbers of lost man hours were reported at 390 hours as staffing hours increased marginally by 6.5 hours from the prior month.



**Figure 4:** Call duration and response time from July 2018 –July 2019.

The Average Talk Time showed no change at 3:04 minutes. The average time with each customer has averaged 2:47 minutes over the last 12 months. The majority of the calls in July were from customers requesting balance inquiries before making payment.

The Average Speed to answer a call is 0:54 seconds. Speed to answer has averaged 1:09 minutes over the last 12 months, for July there was a 0:20 second reduction in time to answer each call, however, staffing levels appear adequate to handle customer requests and inquiries.

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
Customer Appointments	Appointments shall be scheduled within a 2-hour window.	Monthly 07/01/2011	x		
	Ensure 90% of all appointments are fulfilled within the scheduled window. Up to 10% of the customer appointments may be fulfilled within 1-hour after the scheduled window.	Monthly 07/01/2011		x	

Performance Standards	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Customer Appointments												
# of Appointments Scheduled	483	324	422	325	247	335	315	262	234	259	242	389

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
Service Restoration	Service interruptions shall be assessed within 1-hour of notice of interruption and a crew will arrive on site within 2-hours.	Monthly 01/01/2011	x		
	Interruptions shall be repaired and service restored within: 3-hours for 75% of disruptions; 8-hours for 95% of disruptions; 24-hours for 100% of disruptions.	Ongoing 01/01/2011	x		
Service Issues	Respond to reported service issues, including low pressure and poor water quality, within a maximum of 4 business hours, including site visits by field personnel if necessary.	Per Incident 01/01/2011	x		
Customer Contact Reporting	Provide a report identifying and quantifying customer contacts by category and identifying opportunities to reduce the number of frequency of contacts.	Quarterly 04/14/2011. Due the 10th business day following the end of the quarter.	x		

Performance Standards		Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Service Interruptions													
Total Interruptions		13	2	1	2	3	4	4	0	1	0	0	3
Total Restored Within 3- hours		5	0	0	1	2	0	1	0	0	0	0	1
Percent Restored Within 3 - hours		38%	0%	0%	50%	67%	0%	25%	0%	0%	0%	0%	33%
Total Restored Within 8- hours		13	2	0	1	0	0	2	0	1	0	0	1
Percent Restored Within 8 - hours		100%	100%	0%	50%	0%	0%	50%	0%	100%	0%	0%	33%
Total Restored Within 24- hours		13	2	1	2	3	4	4	0	1	0	0	3
Percent Restored Within 24 - hours		100%	100%	100%	100%	100%	100%	100%	0%	100%	0%	0%	100%

## July 2019 - WATER QUALITY CALLS

ADDRESS	DATE REPORTED	DATE RESOLVED	RESOLVED BY	PROBLEM DESCRIPTION
34 CLIFFORD ST	7/9/2019	7/12/2019	SCHEELER	WATER SMELLS WOULD LIKE TO HAVE HIS WATER TESTED. Contacted Customer 7/10/19, Will coordinate with E. Scheeler and M. Zmuda to set up inspection/sampling. 7/12/19 @ 0900, upon initial inspection, water in downstairs bathroom ran cold and clear. There was a slight smell of sulfur right when the water is turned on , but dissipates immediately. Cl2 reading, 0.98 and 0.99 ppm. Upstairs bathroom read 1.01ppm Cl2. Collected bacti samples from both locations. EGS NEG in both locations. Letter to be sent to homeowner.
1776 NIAGARA ST	7/23/2019	7/24/2019	SCHEELER	Auto flush at location broke a few weeks ago and location had brown water. Since has cleared but would like water quality checked. Scheduled for Wed 7/24/19 @ 0930 EGS KITCHEN SINK: measured 0.29 Cl2 @ 1015, 0.35 Cl2 @ 1021. Collected BACTI sample. NEG for COLIFORM and ECOLI. GARAGE WOMENS BATHROOM: measured 0.25 @ 1035, 0.25 @ 1041. Collected BACTI sample. NEGATIVE for COLIFORM and Ecoli.
118 IVY ST	7/24/2019	7/24/2019	SCHEELER	7/24/19..CALL CAME FROM ROLL LINE, THERE IS NO LEAK ON LINE, CALLER WOULD LIKE WATER TESTED, REPORTS FUNNY TASTE AND SMELL..HE WILL ALSO CALL 311 FOR LEAD AND COPPER TESTING..Z114 7/24/19 EGS Collected sample from kitchen sink. Water was cold and clear, no odor. Cl2 0.19 ppm @ 1133. Colled Bacti and unpreserved sample for testing. NEGATIVE for Col/Ecoli. EGS
104 IVY ST	7/25/2019	7/25/2019	SCHEELER	7/25/19..CALLER REPORTS ODOR PROBLEM WITH WATER..WANTS WQ CALL.. Collected sample at kitchen sink at 0854. Cl2 1.15 ppm. Brought bacti sample and unpreserved sample back to lab for analys. Water was cold and no odor was detected. EGS MON OR TUE IN AM..BTW 9 AND 11

Performance Standards	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Meter Reads												
Quarterly Actual Reads	19,350	16,870	22,700	19,619	17,020	22,841	19,521	16,962	22,885	19,861	16,967	22,924
Quarterly Estimates / Inoperable Meters	1,877	1,050	1,592	1,660	928	1,489	1,828	1,012	1,451	1,550	1,025	1,428
Quarterly Percent of Actuals	91.2%	94.1%	93.4%	92.2%	94.8%	93.9%	91.4%	94.4%	94.0%	92.8%	94.3%	94.1%
Monthly Actual Reads	955	956	951	951	934	915	838	919	924	943	940	946
Monthly Estimates / Inoperable Meters	27	28	34	35	51	70	144	64	58	42	48	38
Monthly Percent of Actuals	97.3%	97.2%	96.5%	96.5%	94.8%	92.9%	85.3%	93.5%	94.1%	95.7%	95.1%	96.1%
Total Reads	22,209	18,904	25,277	22,265	18,933	25,315	22,331	18,957	25,318	22,396	18,980	25,336

Performance Standards	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Metering												
Meters Replaced or Installed	172	135	271	163	147	244	252	177	166	178	159	174
Radio Readers Installed	3	1	2	1	2	5	0	5	4	8	2	1
Meter Installed (Flat to New)	49	22	16	29	11	16	19	12	8	25	28	18
Meter Touchpad/Radio Repairs	163	88	55	49	30	40	25	59	55	26	21	48
Monthly Totals	387	246	344	242	190	305	296	253	233	237	210	241



Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
BILLING AND COLLECTIONS					
Collections	Veolia shall use its best efforts to meet a minimum annual collection rate of 96%. The average annual collection rate shall be reported monthly to the Water Board. If the average annual collection rate falls below 96%, Veolia shall promptly issue reminder notices to all delinquent customers and shall identify and implement, with approval from the Representative, any collection activities that would result in improved collection performance. The target collection rate shall be reviewed each Contract Year and may be adjusted, or subject to liquidated damages or an incentive fee as agreed to by the Parties.	Monthly/ Annually 07/01/2010	x		

Monthly	July 2019	July 2018	Variance	% Change
Charges - Current Month	\$4,304,765	\$3,588,735	\$716,031	19.95%
Adjustments - Current Month	(\$24,977)	(\$55,374)	\$30,397	54.89%
Net Charges - Current Month	\$4,279,788	\$3,533,361	\$746,427	21.13%
Revenues	<b>\$3,751,371</b>	\$2,834,914	\$916,457	32.33%
Percent of Collections	87.65%	80.23%	7.42%	

Cumulative	Current Year	Previous Year	Variance	% Change
Charges	\$4,304,765	\$3,588,735	\$716,030	19.95%
Adjustments	(\$24,977)	(\$55,374)	\$30,397	54.89%
Net Charges	\$4,279,788	\$3,533,361	\$746,427	21.13%
Revenues	<b>\$3,751,371</b>	\$2,834,914	\$916,457	32.33%
Percent of Collections	87.65%	80.23%	7.42%	

## MONTHLY CHANGES IN WATER SERVICE ACCOUNTS RECEIVABLES

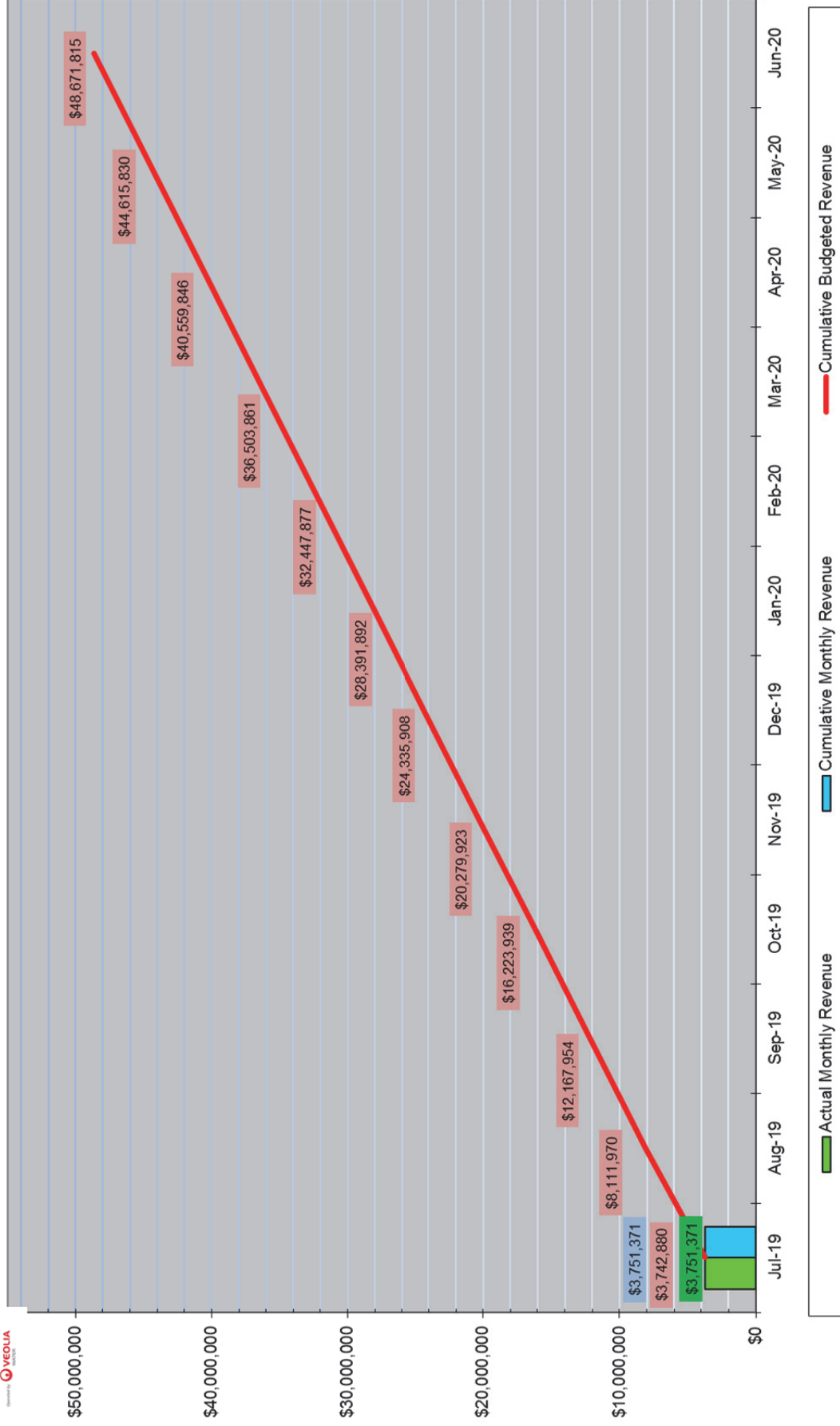
Group/Income Center	July AR Balance	June AR Balance	Difference
Service / WATER FLAT	\$3,457,197	\$3,345,292	\$111,905
Service / WATER FLAT CAPACITY	\$46,972	\$58,364	(\$11,392)
Service / WATER MONTHLY METER	\$1,220,348	\$1,233,998	(\$13,650)
Service / WATER QUARTERLY METER	\$9,070,687	\$8,629,133	\$441,554
<b>Totals:</b>	<b>\$13,795,205</b>	<b>\$13,266,787</b>	<b>\$528,418</b>
Service / COLLECTION FEE	\$5,429	\$5,429	\$0
Service / COMMISSION WATER	\$885,437	\$885,292	\$146
Service / WATER PENALTY	\$7,864,318	\$7,833,598	\$30,720
<b>Totals:</b>	<b>\$8,755,183</b>	<b>\$8,724,318</b>	<b>\$30,866</b>
<b>Grand Total</b>	<b>\$22,550,388</b>	<b>\$21,991,105</b>	<b>\$559,283</b>

Accounts Receivable	Unbilled	< 90	90-179	180-269	270-359	360+	Totals:
Service / WATER FLAT	\$353,600	\$244,229	\$269,846	\$125,858	\$120,690	\$2,342,974	\$3,457,197
Service / WATER FLAT CAPACITY	\$75	\$175	\$28,619	\$18,103	\$0	\$0	\$46,972
Service / WATER MONTHLY METER	\$265,697	\$85,893	\$86,857	\$37,285	\$23,976	\$720,640	\$1,220,348
Service / WATER QUARTERLY METER	\$443,316	\$3,269,407	\$704,176	\$329,179	\$297,955	\$4,026,654	\$9,070,687
<b>TOTAL ALL WATER SERVICE ACCOUNTS</b>	<b>\$1,062,688</b>	<b>\$3,599,704</b>	<b>\$1,089,498</b>	<b>\$510,426</b>	<b>\$442,621</b>	<b>\$7,090,268</b>	<b>\$13,795,205</b>

Service / COMMISSION WATER						\$885,437	\$885,437
----------------------------	--	--	--	--	--	-----------	-----------



## Actual Service Revenue vs Budgeted Revenue Contract Year 10



\*Service revenues reported are from cash receipts from monthly metered, quarterly metered, flat capacity, and fire supply water rates.

Performance Standards	Scope	Term/Due Date	Status		
			Completed	In Progress	Not Required
SAFETY AND TRAINING					
Emergency Preparedness Plan	Prepare an Emergency Preparedness Plan (EPP) covering all areas of system operation.	October, 2010	X		
	Update the EPP on an ongoing and when required basis. Any updates to the EPP will be clearly dated and the EPP will be noted to reflect it was subject to at least a quarterly review.	Quarterly		X	
Quarterly Review	Reviewed and revised with updates with full review of plan updating individual names and titles.	October, 2016	X		

## Appendix A - Health Department Monthly Log – Raw Water (July, 2019)

Date	Temp F°	Pumpage MGD	Turbidity NTU	pH	Pre Cl <sub>2</sub> Lbs/Day	Coagulant A gals/day	Coagulant A PPM
1	67	70.85	0.80	8.0	1,664	347	5.90
2	69	68.75	0.80	8.2	1,683	337	5.91
3	69	67.93	0.89	8.2	1,690	332	5.89
4	70	71.48	0.85	8.2	1,801	352	5.93
5	71	68.82	0.77	8.2	1,747	342	5.99
6	72	66.61	0.66	8.2	1,731	310	5.61
7	73	67.30	0.71	8.2	1,812	313	5.60
8	72	67.50	0.64	8.2	1,786	304	5.43
9	71	71.03	0.52	8.2	1,741	347	5.89
10	71	72.93	0.52	8.2	1,754	377	6.23
11	72	71.68	0.60	8.2	1,817	375	6.30
12	71	66.40	0.57	8.2	1,720	340	6.17
13	71	67.79	0.61	8.3	1,580	342	6.08
14	71	70.39	0.60	8.2	1,830	360	6.16
15	72	73.42	0.70	8.2	1,902	389	6.38
16	72	72.98	0.67	8.2	1,634	420	6.93
17	72	69.11	0.68	8.2	1,691	393	6.85
18	73	71.78	0.70	8.2	1,881	393	6.60
19	73	70.19	0.72	8.2	1,811	364	6.25
20	74	69.14	0.77	8.2	1,811	378	6.59
21	75	67.75	0.75	8.1	1,852	354	6.30
22	75	68.89	0.77	8.2	2,001	371	6.49
23	75	70.35	0.69	8.2	1,845	413	7.07
24	74	73.38	0.72	8.1	2,211	435	7.14
25	74	75.86	0.76	7.9	2,198	448	7.12
26	74	74.88	0.61	7.9	2,138	440	7.08
27	74	70.15	0.60	7.9	2,041	406	6.97
28	75	69.21	0.81	7.8	1,958	440	7.66
29	75	76.98	1.00	7.8	2,186	516	8.08
30	75	67.87	0.76	7.8	2,010	456	8.10
31	75	70.48	0.74	7.8	2,202	474	8.10
Tot:		2,182			57,728	11,868	
Avg:	72	70	0.71	8.1	1,862	383	6.54

Hi:	75	77	1.00	8.3	2,211	516	8.10
Lo:	67	66	0.52	7.8	1,580	304	5.43

## Appendix B - Finished Water Data (July, 2019)

Date	Pumpage MGD	To-Distribution MGD	Turbidity NTU	pH	Fluoride Cmpd lbs/day	Fluoride ppm	Chlorine ppm	Corrosion Control gals/day	Ortho/Polyphosphate ppm	Contact Time (CT) (min-Cl ppm)	Inactivation Ratio
1	68.83	68.83	0.17	7.6	0	0.00	1.31	60	0.24	265	11.04
2	67.64	67.64	0.18	7.6	0	0.00	1.31	68	0.27	270	12.11
3	69.11	69.11	0.18	7.6	0	0.00	1.28	68	0.27	255	11.48
4	69.44	69.44	0.19	7.6	0	0.00	1.24	60	0.22	248	11.63
5	71.23	71.23	0.19	7.6	0	0.00	1.19	52	0.27	231	11.32
6	66.72	66.72	0.19	7.6	0	0.00	1.23	52	0.21	257	13.08
7	66.66	66.66	0.19	7.6	0	0.00	1.21	36	0.23	252	13.43
8	68.66	68.66	0.19	7.6	0	0.00	1.25	52	0.28	253	12.89
9	69.26	69.26	0.20	7.6	0	0.00	1.29	44	0.23	257	12.48
10	72.06	72.06	0.18	7.6	0	0.00	1.25	44	0.20	238	11.63
11	69.67	69.67	0.18	7.6	0	0.00	1.27	32	0.22	254	12.38
12	68.61	68.61	0.18	7.6	0	0.00	1.25	36	0.19	252	12.31
13	67.83	67.83	0.18	7.6	0	0.00	1.31	44	0.18	270	12.56
14	70.61	70.61	0.17	7.6	0	0.00	1.25	36	0.14	245	11.96
15	73.77	73.77	0.20	7.6	0	0.00	1.28	30	0.23	242	11.79
16	72.38	72.38	0.18	7.6	0	0.00	1.23	36	0.18	235	11.49
17	68.30	68.30	0.19	7.6	0	0.00	1.20	28	0.22	250	12.27
18	70.33	70.33	0.19	7.6	0	0.00	1.24	28	0.16	236	12.61
19	69.87	69.87	0.19	7.6	0	0.00	1.26	28	0.16	252	12.86
20	69.33	69.33	0.18	7.6	0	0.00	1.26	28	0.14	252	14.02
21	69.57	69.57	0.18	7.6	0	0.00	1.19	28	0.14	238	14.01
22	69.03	69.03	0.19	7.5	0	0.00	1.17	28	0.34	234	13.83
23	70.40	70.40	0.22	7.6	0	0.00	1.06	28	0.32	209	11.98
24	73.74	73.74	0.21	7.6	0	0.00	1.31	28	0.22	248	13.74
25	74.62	74.62	0.24	7.5	0	0.00	1.21	36	0.11	225	12.55
26	72.76	72.76	0.23	7.5	0	0.00	1.23	20	0.32	235	13.09
27	70.36	70.36	0.20	7.6	0	0.00	1.26	28	0.17	248	13.79
28	70.54	70.54	0.20	7.5	0	0.00	1.19	22	0.13	234	14.27
29	70.54	70.54	0.20	7.5	0	0.00	1.17	20	0.31	109	6.44
30	69.06	69.06	0.21	7.5	0	0.00	1.16	16	0.39	232	14.19
31	70.31	70.31	0.22	7.5	0	0.00	1.19	20	0.47	234	13.75
Tot:	2,171	2,171			0			1,136			
Avg:	70.04	70.04	0.19	7.60	0	0.00	1.23	37	0.23	241	12.48

Hi:	74.62	74.62	0.24	7.60	0	0.00	1.31	68	0.47	270	14.27
Lo:	66.66	66.66	0.17	7.50	0	0.00	1.06	16	0.11	109	6.44

## Appendix C – Water Quality Database

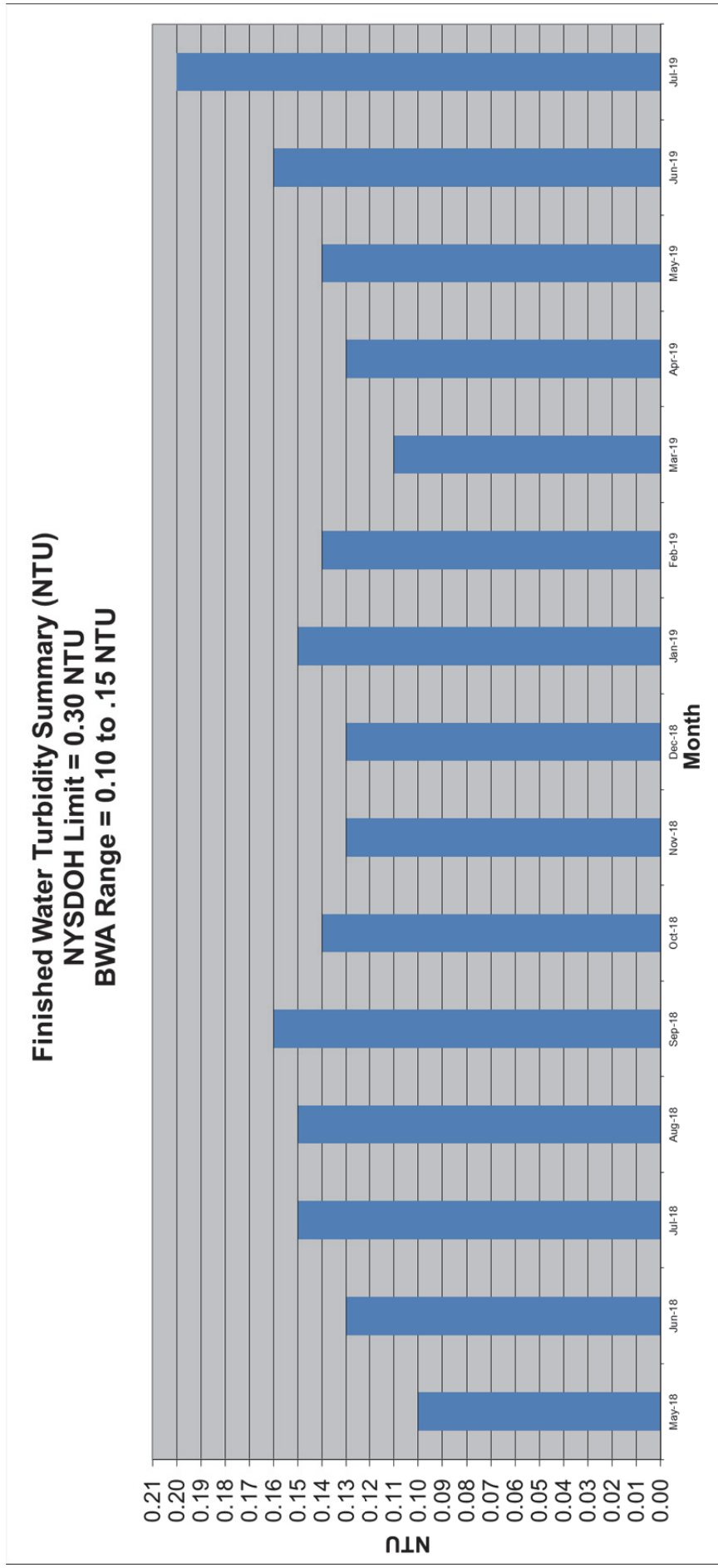
City of Buffalo, NY  
Public Water Supply Permit  
PWSID # 1400422

		2018												2019											
		May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19									
Parameter	MCL or Action Level	66.10	68.87	72.21	69.82	67.96	62.21	60.97	60.77	65.73	72.81	69.74	67.53	66.07	66.37	74.97									
Average Monthly Production, MGD																									
Bacti Report																									
# Performed	150	191	187	207	201	178	208	182	174	187	180	196	191	200	186	213									
# Positive Total Coliform		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00									
# Positive Fecal Coliform		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
Average Free Cl <sub>2</sub> in Distribution, mg/l	0.2	0.91	0.92	0.83	0.88	0.92	0.98	0.91	0.91	0.85	0.81	0.81	0.89	0.96	0.94	0.91									
Average Total Cl <sub>2</sub> Leaving Plant, mg/l		1.32	1.42	1.45	1.46	1.43	1.40	1.34	1.31	1.31	1.33	1.28	1.31	1.36	1.43	1.43									
Average Raw Water pH, s.u.		8.10	8.10	8.20	8.20	8.20	7.90	8.00	8.00	7.94	8.00	8.00	7.90	7.88	7.90	8.20									
Average Finished Water pH, s.u.		7.60	7.70	7.70	7.70	7.70	7.60	7.70	7.60	7.61	7.60	7.65	7.60	7.60	7.59	7.60									
Average Fluoride, mg/l		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
Average e.coli col/100ml raw water		0.53	0.00	0.16	5.65	0.44	10.33	1.37	1.53	0.71	0.06	0.00	0.35	0.00	0.00	7.06									
Average crypto oocysts/L raw water		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A									
Average Turbidity, n.t.u., Raw Water		1.53	0.65	0.54	1.03	0.66	3.10	9.58	4.94	5.54	2.05	0.88	1.61	1.21	1.71	0.72									
Average Turbidity, n.t.u., Finished Water		0.10	0.13	0.15	0.15	0.16	0.14	0.13	0.13	0.15	0.14	0.11	0.13	0.14	0.16	0.20									
Average Turbidity, n.t.u., Distribution System		0.12	0.16	0.19	0.19	0.21	0.19	0.18	0.20	0.20	0.20	0.11	0.18	0.19	0.21	0.24									
Average Free Cl <sub>2</sub> Leaving Plant, mg/l		1.08	1.22	1.23	1.25	1.22	1.19	1.13	1.12	1.11	1.12	1.06	1.11	1.13	1.21	1.23									
Quarterly Samples Collected	LIMITS	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL									
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40	X			X		X	X	X		X	X	X	X	X	X									
TOCS,DOCS,UV254		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
Annual Samples Collected (in 2012 / 2013)	LIMITS	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL									
Parameter	MCL																								
Inorganic Chemicals							X						X												
Radiologicals																									
Nitrates							X						X												
Arsenic							X						X												
Selenium							X						X												
Lead & Copper (50 required)																									
Principal Organic Contaminants																									
Specific Organic Contaminants																									
Principal Inorganic Contaminant													X												
													X												

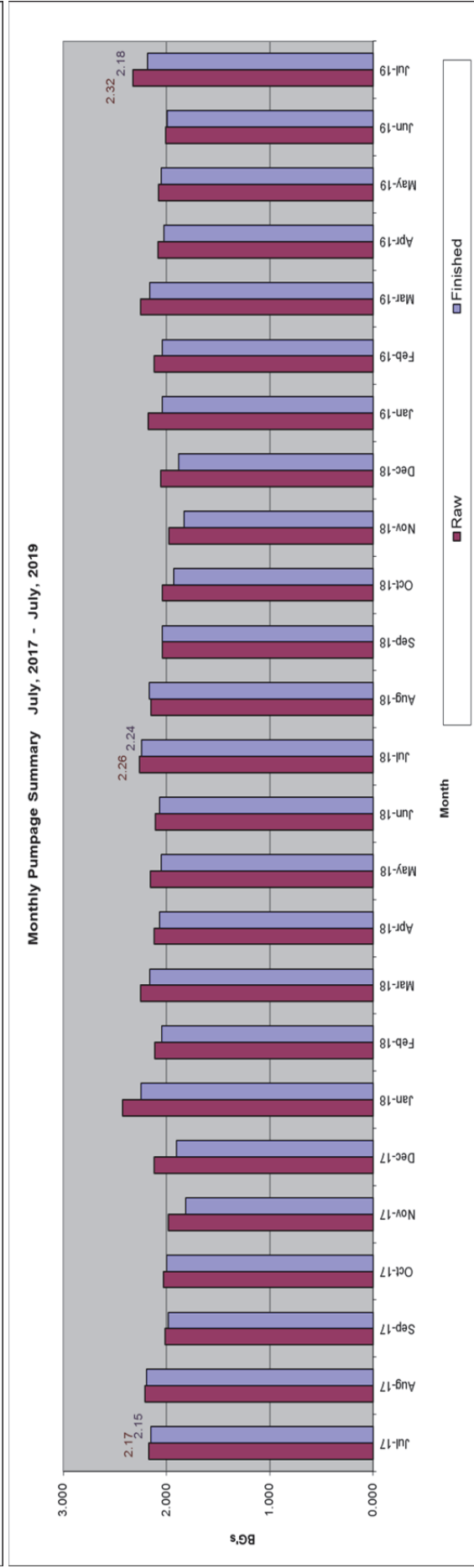
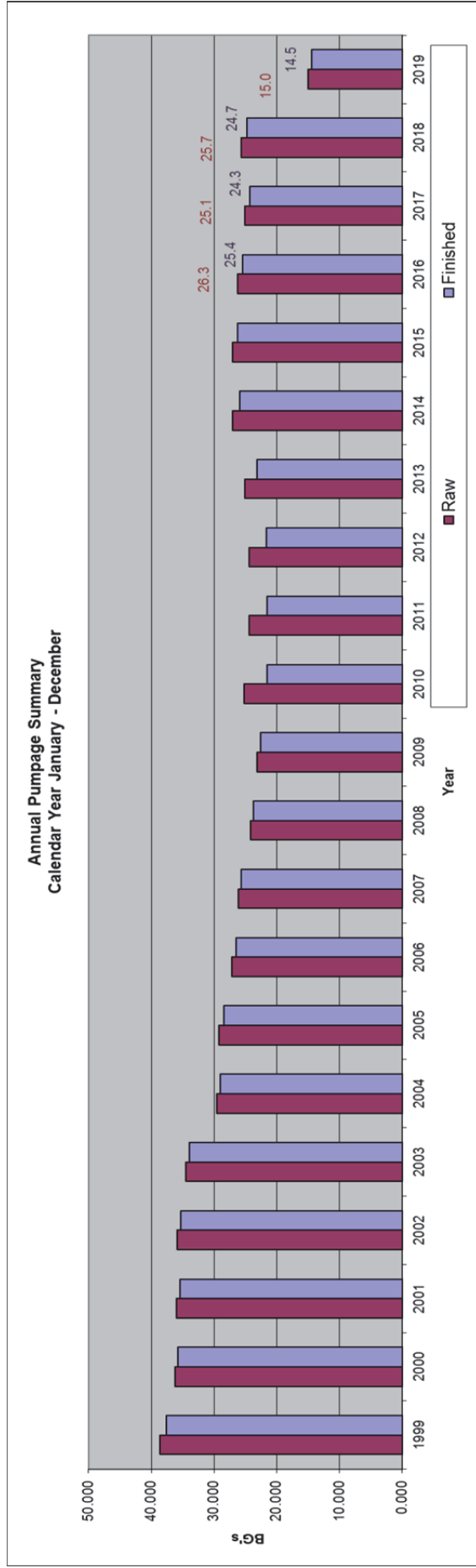
\*\*\* - The Interim Enhanced Surface Water Treatment Rule (USEPA regulation) requires a maximum of 0.30 NTU [Nephelometric Turbidity Units]



## Appendix D - Finished Water Turbidity Summary



## Appendix E – Water Pumpage – Historical Summary



## Appendix F – Distribution Department Reports

	2018						2019							
	June	July	August	September	October	November	December	January	February	March	April	May	June	July
Fire Hydrants Repaired	30	21	36	23	29	20	21	32	44	39	52	84	41	20
Fire Hydrants Installed	19	16	26	20	11	12	6	10	15	13	14	36	13	13
Fire Hydrants Out of Service	33	26	26	17	26	19	16	26	32	34	34	40	35	19
Water Main Leaks	29	59	29	22	15	17	29	48	69	30	29	21	19	33
Water Main Leaks Repaired	27	58	31	20	15	18	22	53	68	29	28	22	16	35
Water Service Leaks	4	6	6	5	4	2	5	3	0	5	6	4	1	4
Water Service Leaks Repaired	3	7	4	6	5	2	3	5	0	5	4	5	1	5
Delinquency Turn offs	336	278	309	281	383	384	216	200	313	282	327	407	246	266
Unables	193	212	184	157	254	254	154	139	262	223	198	187	144	137
Postings	2,074	3,703	2,567	1,890	3,794	2,739	1,901	3,473	2,696	2,482	3,232	3,048	1,578	3,505

### Winter Fire Hydrant Program

Hydrants Checked									4,793	5,108	6,249	5,822	6,132	5,950
Hydrants Pumped									378	425	448	434	450	421

### Summer Fire Hydrant Program

Hydrants Greased	1,072	783	942	236							1,327	1,677	768	0
Hydrants Flushed	778	554	628	152							1,094	1,362	615	0
Fire Hydrants Painted by Buffalo Water	1	0	1	0							27	20	18	9
Fire Hydrants Painted by contracted labor	0	0	0	0							0	0	0	0

## Appendix G – Electric Summary

**This will be provided annually or as requested.**

## Appendix H – Gas Summary

**This will be provided annually or as requested.**

## Appendix I – MVA & PI Summary



### MEASURE: MOTOR VEHICLE INCIDENTS

**DEFINITION:** Monthly and Year to Date  
Motor Vehicle Incident Counts

**TARGET:** Zero

**MONTH:** Jul

**YEAR:** 2019

### THIS MONTH'S SUMMARY

<b>MVA's - # This Month</b>	1
<b>Y-T-D Total</b>	15

### MVA Summary

01/17/2019 - Buffalo Water Unit 179 was struck by third party  
 01/17/2019 - Buffalo Water Unit 346 struck 3rd party at Porter Ave  
 01/22/2019 - Buffalo Water Unit 319 was struck by third party  
 01/23/2019 - Buffalo Water Unit 240 struck 3rd party  
 01/29/2019 - Buffalo Water Unit 366 was struck by third party  
 02/06/2019 - Buffalo Water Unit 365 struck 3rd party  
 02/15/2019 - Buffalo Water Unit 351 struck third party  
 02/21/2019 - Buffalo Water Unit 285 struck 3rd party .  
 04/24/2019 - Buffalo Water Unit 219 was struck by third party  
 04/29/2019 - Buffalo Water Unit 333 struck third party  
 05/03/2019 - Buffalo Water Unit 333 struck by third party  
 6/10/2019 - Buffalo Water Unit 312 struck by 3rd party  
 6/28/2019 - Buffalo Water Unit Struck by bicycle  
 6/28/2019 - Buffalo Water Struck third party  
 7/29/2019 - Buffalo Water 246 struck by third party

### ANNUAL ACTIVITY

Incident / Injury	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	YTD Total
MVA Non-injury	5	3	0	2	1	3	1						15
MVA Injury	0	0	0	0	0	0	0						0
<b>MVA TOTAL</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>

## Appendix J – Plant Maintenance Work Order Summary

DATE	WO NUMBER	WORK TASK	ASSET_DESC	WORK_DESC	COMMENTS
7/1/19	1900724	4	BWA-WT-Intake - General Facility Asset	MONTHLY BUILDING INSPECTION	Completed by Joe Sperrazza
7/3/19	1900842	1	Asset List	Monthly Portable Gas Detector Calibrations	complete by Stegura // 3 units failed taken out of service to be replaced
7/3/19	1900842	2	Asset List	Monthly Portable Gas Detector Calibrations	complete by Stegura
7/5/19	1900852	12	BWA-WT-Intake - General Facility Asset	MONTHLY BUILDING INSPECTION	complete by Stegura
7/5/19	1900852	13	BWA-WT-Intake - General Facility Asset	MONTHLY BUILDING INSPECTION	complete by Stegura
7/8/19	1900876	1	Asset List	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	No signs of abnormal leakage from seals. Good water cooling flow & bearing temps.  Completed by George Sawyer.
7/8/19	1900868	4	MASS-High Service-P1-Pumps/Pump	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	complete by Murphy
7/9/19	1900856	1	CENTRIFUGE, WESTFALIA SEPARATOR	MONTHLY PM - CENTRIFUGE MANUFACTURER RECOMMENDED	complete by Stegura
7/9/19	1900845	1	CENTRIFUGE, WESTFALIA SEPARATOR	MONTHLY POLYMER MIXING PM	complete by Stegura
7/30/19	1900953	1	CENTRIFUGE, WESTFALIA SEPARATOR	MONTHLY PM - CENTRIFUGE MANUFACTURER RECOMMENDED	complete by Stegura
7/30/19	1900949	15	BWA-WT-Intake - General Facility Asset	MONTHLY BUILDING INSPECTION	complete by Stegura

## Appendix K – Street Cuts and Street Repair Work Order Summary

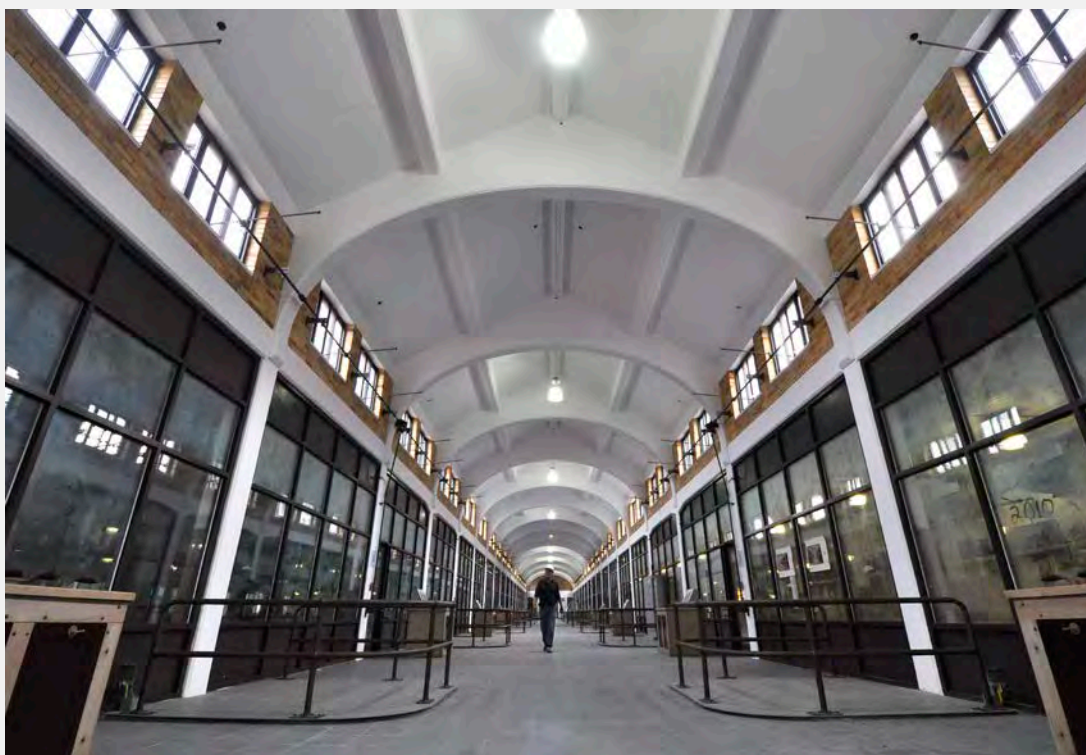
Work Order Number	Date completed	Location	Nearest Cross Street	Cut Location Description
1554143691	7/2/2019	INT NORTHAMPTON ST	JEFFERSON AVE	2' N 9' E OF SWC NORTHAMPTON AND JEFFERSON
1554147658	7/2/2019	O JEFFERSON AVE	DODGE ST	11' N 13' E OF NWC JEFFERSON & DODGE
1558030431	7/31/2019	INT THATCHER AVE	KENSINGTON AVE	21'S 4'E OF NW KENSINGTON
1560426488	7/18/2019	INT DETROIT ST	WILLIAM ST	12' N 8' E NWC DETROIT & WILLIAM
1561563854	7/5/2019	29 A ST	MILLS ST	2' S 349' W SWC A ST & MILLS
1561634423	7/3/2019	NEC HOLLAND PL	NORTHAMPTON ST	17'N 4'E OF NWC NORTHAMPTON AND HOLLAND
1561975040	7/2/2019	117 LORING AVE	MEECH ST	2'S 20'E OF SEC LORING & MEECH
1562096470	7/2/2019	155 EVELYN ST	ONTARIO ST	101'N 7'E OF HYD AT DEAD END
1562598956	7/31/2019	NWC ARGUS ST	ESSER AVE	
1562856840	7/22/2019	SWC AUBURN AVE	RICHMOND AVE	4' S 24' W OF SW RICHLAWN
1562927854	7/25/2019	232 IDEAL ST	E LOVEJOY ST	455' S 2' W OF SW VANDERBILT
1563228344	7/16/2019	SEC HOFFMAN PL	AUSTIN ST	4' S- 8'W OF SEC OF AUSTIN
1563517604	7/26/2019	INTERSECTION SMITH ST	WILLIAM ST	10' N 8' E OF NWC SMITH & WILLIAM
1563517361	7/23/2019	INTERSECTION WILLIAM ST	DETROIT ST	30'S 22'E NEC WILLIAM & DETROIT
1563973943	7/29/2019	AROUND 43 FAY ST	W SHORE AVE	44' N 17' E OF 1ST HYD NORTH OF WEST SHORE
1564133442	7/26/2019	SWC LAYER AVE	SIMON ST	15' s 1' e swc of layer
1564406783	7/31/2019	SWC ELLICOTT ST	GENESSEE ST	24'S 3'E OF SWC GENESSEE AND ELLICOTT
1564500806	7/31/2019	1029 KENSINGTON AVE	COPEWOOD AVE	12'N 35'E OF SEC KENSINGTON AND COPESWOOD
1564528300	7/31/2019	INT Esser Ave	ARGUS ST	23'W 26'S OF NEC ESSER AND ARGUS
1561635050	7/1/2019	192 CRESTWOOD AVE	HERTEL AVE	414' S 6' E OF SWC CRESTWOOD AND TACOMA
1561642735	7/1/2019	OPP. #564 WINSPEAR AVE	ORLEANS ST	8' N 531'W OF SEC WINSPEAR & ORLEANS
1561711661	7/2/2019	114 CLAREMONT AVE	BIRD	206'S 6'E OF SWC CLAREMONT & BIRD
1562060141	7/2/2019	POLE #160 EVELYN ST	ONTARIO ST	16'S 23'W POLE 160 EVELYN
1562230589	7/4/2019	100FT EAST KENEFICK AVE	SOUTHSIDE PKWY	6' N 91' E SEC KENEFICK & SOUTHSIDE

Work Order Number	Date completed	Location	Nearest Cross Street	Cut Location Description
1562280049	7/5/2019	591 MARILLA ST	MCKINLEY PKWY	5' N 838' W SWC OF MCKINLEY
1562334012	7/8/2019	465 HOPKINS ST	TROWBRIDGE ST	87 FT NORTH 28 FT WEST OF NEC PRIES
1562548910	7/12/2019	291 SENECA ST	CHICAGO ST	17 1/2 FT SOUTH 84 FT EAST OF NEC CHICAGO
1562591910	7/8/2019	32 COPELAND PL	ONTARIO ST	345' FT S 6 FT EAST OF SWC COPELAND AND ONTARIO
1562620668	7/8/2019	32 COPELAND PL	ONTARIO ST	352 FT SOUTH 6 FT EAST SWC COPELAND AND ONTARIO
1562629558	7/9/2019	0 Locust St	BFNC DRIVE	18'N 8'E OF NWC LOCUST AND B.F.N.C.
1562664468	7/9/2019	32 COPELAND PL	ONTARIO ST	307' 5'E OF SWC HUNT AND COPELAND
1562664042	7/9/2019	SWC COPELAND PL	ONTARIO ST	17'S 7'E OF SWC OF ONTARIO
1562758266	7/22/2019	245 SHIRLEY AVE	BAILEY AVE	5 1/2' N 283' W OF SEC SHIRLEY AND BAILEY
1563153101	7/15/2019	15 HOFFMAN PL	HAMILTON ST	202' N- 7' W OF NEC OF HAMILTON
1563158846	7/15/2019	50' E OF NIAGARA HUDSON ST	NIAGARA ST	6' S 30' E OF NEC HUDSON & NIAGARA
1563175571	7/15/2019	POLE 139 GREAT ARROW AVE	LINCOLN PKWY	5' N 184' W SWC GREAT ARROW & LINCOLN PKWY
1563195354	7/16/2019	INT HOFFMAN PL	AUSTIN ST	ON SOUH CURBLINE- 7' W ON OF AUSTIN AND HOFFMAN
1563217022	7/15/2019	113 SHEFFIELD AVE	S PARK AVE	4' N 1223' W SWC OF MCKINLEY
1563285722	7/16/2019	806 TACOMA AVE	STARIN AVE	6'N 273;E OF SEC TACOMA & STARIN
1563368532	7/19/2019	412 GOETHE ST	REIMAN ST	225'N 5'-6' E NWC REIMAN
1563403964	7/18/2019	112 DENSMORE AVE	BEALE ST	6' 10" S 472' E NEC BEALE ST
1563793757	7/23/2019	30FT WEST WALDEN AVE	GITTERE ST	10'N 25'W O SWC WALDEN AND GITTRE
1563888881	7/24/2019	308 BOX AVE	MOSELLE ST	9'N 893W SWC MOELLE
1563932240	7/24/2019	10'S POLE #10 BUFFUM ST	SENECA ST	62'N 2'E OF NWC BUFFUM AND SENECA
1563952985	7/24/2019	90 DUNSTON AVE	ONTARIO ST	18'S 190'W OF NWC DUNSTON & KENMORE
1563964309	7/25/2019	95 FEET WEST ELK ST	BRADFORD ST	31'S - 89'W OF NWC OF ELK AND BRADFORD
1563970028	7/24/2019	78 TO 84 SIMON ST	LAYER AVE	127'S 7'E OF SWC OF SIMON & LAYER
1563991497	7/25/2019	229 BERKSHIRE AVE	COMSTOCK AVE	6' N 40' E SEC BERKSHIRE & COMSTOCK
1564001568	7/25/2019	258 DETROIT ST	PADEREWSKI DR	306'N - 8'E NWC
1564044766	7/25/2019	SEC DODGE ST	MICHIGAN AVE	6' N 30' E OF SEC DODGE AND MICHIGAN



Work Order Number	Date completed	Location	Nearest Cross Street	Cut Location Description
1564055063	7/25/2019	Opposite pole 87 SIMON ST	LAYER AVE	106' S 5' E SWC OF LAYER
1564455009	7/30/2019	20' E OF POLE 825 Delaware Ave	FOREST AVE	10'N 7'W OF SWC DELAWARE & FOREST
1564474851	7/30/2019	138 DART ST	LETCHWORTH ST	205'S 7'W OF SEC DART & LETCHWORTH
1561028734	7/26/2019	OPP #1087 W DELAVAN AVE	MAIN ST	100' E POLE #1052
1562072980	7/30/2019	DEAD END EVELYN ST	ONTARIO ST	DEAD END OF EVELYN
1563545810	7/23/2019	369 WEST AVE	Porter Ave	291'N 3'E OF NEC WEST & JERSEY

**Summary: Total Restorations to Date in 2019**
**New Cuts Requiring Restoration Created in July 2019**
**Complete Restorations Performed (as of July 2018)**
**Total Potential Restorations Remaining**
**406**
**56**
**1,413**
**5,635**



# ***VEOLIA NORTH AMERICA, BUFFALO PROJECT ANNUAL REPORT***

***Contract Year 8 Ending June 30, 2018***

## **Buffalo Water Board**

<b>Chairperson:</b>	Oluwole McFoy, P.E.
<b>Member:</b>	Michael Finn, P.E.
<b>Member:</b>	Gerald E. Kelly
<b>Member:</b>	William L. Sunderlin

## **City of Buffalo**

**Commissioner of Public Works, Parks & Streets**  
Steven Stepniak

**City Engineer**  
Michael Finn, P.E.

**Principal Engineer**  
Peter Merlo, P.E.

# ***VEOLIA NORTH AMERICA, BUFFALO PROJECT ANNUAL REPORT***

***Contract Year 8 Ending June 30, 2018***



## **Veolia Management Team**

<b>V.P. of Operations:</b>	Tim Shea, P.E.	(401) 781-5260
<b>Project Manager:</b>	David Hill	(270) 570-3040
<b>Operations Manager:</b>	Douglas Fultz, P.E.	(716) 262-6627
<b>Technical Manager:</b>	Michael Carson	(716) 388-7992
<b>Customer Service Manager:</b>	Damond Rand	(716) 239-8956
<b>Asset Manager:</b>	Colleen Makar	(716) 507-3147
<b>Office Manager:</b>	Elina Flores	(716) 435-4068
<b>Billing Manager:</b>	Damon Sykes	(716) 536-4752

## Table of Contents

- a. Executive Summary
- b. Compliance Summary
  - i. B.P.D.E.S. Permit 11-09-BU230
  - ii. S.P.D.E.S. Permit NY 003 2174
  - iii. 2015 Tier II Hazmat Report
  - iv. 2015 Outfall Report
  - v. 2015 Water Withdrawal Report
  - vi. 2015 Water Quality Report
- c. Operation and Maintenance Summary
  - i. Water Pumpage Historical Summary
  - ii. Effluent Pumpage Performance Trend
- d. Capital Improvement Recommendations Report and Projected System Work for the following Contract Year
- e. Staffing Summary
- f. Occupational Health and Safety Summary
  - i. Motor Vehicle Accidents, Personal Injury, and Lost Time Injury Summary
- g. Complaint Summary
- h. Compliance Issues
  - i. Historical Water Quality Data
- i. Customer Satisfaction Survey
- j. Fleet Summary
  - i. General Vehicle Contractual Compliance
  - ii. Fleet Inventory & Condition
- k. Collection Performance and Activities
- l. Customer Service Issues and Discussion
- m. General Plant Conditions
- n. Outstanding Work Order Summary
  - i. OWAM Work Order Backlog Report
  - ii. InfoNet Work Order Backlog Report
- o. 2016 Annual Water Audit
- p. Status of System Energy Usage
  - i. Electric Usage Summary
  - ii. Natural Gas Usage Summary
- q. Annual Safety Audit
- r. Annual Leak Detection Report
- s. Annual Inventory Report
  - i. Chemical Inventory
  - ii. Meter Inventory
  - iii. Operating Supplies – Stockroom

# Executive Summary



## EXECUTIVE SUMMARY

### ❖ **Contract Year 8 Operational Overview**

Service revenues for flat, quarterly, and monthly metered accounts came in at \$39.5 million for CY8. Service revenue was slightly below the annual goal of \$40 million that has been achieved each year since the last rate increase at the start of CY3 set on July 1, 2012. Revenues for the top 25 users in the service territory were unchanged from the prior year. Reduced consumption from residential customers contributed to reduced demand for water services and impacted revenues negatively. Collection efforts remain strong as a high percentage of billed charges are converted to revenue during the course of the year.

Training and technology enhancement initiatives improved customer service telephone performance, which continues to play an optimal role in our operational achievements throughout the contract year. Several security enhancements were implemented in CY8 including the installation of additional security cameras and the construction of a customer conference office.

Further development of Oracle® Utilities Work and Asset Management (OWAM) and InfoNet™, computerized maintenance management systems (CMMS), continued throughout the year. City of Buffalo (City) personnel are actively involved in both systems by supporting and implementing mobile applications. OWAM is utilized for aboveground asset management (AGAM) with its preventive maintenance (PM) system being utilized by City personnel via work orders. Standard operating procedures (SOPs) and PMs are continually refined for existing assets and developed for new assets.

InfoNet™ is continually being updated with distribution system improvements and changes made over the past 10 – 15 years. As the InfoNet™ database is further developed, accuracy of distribution system asset locations and characteristics will continue to improve, enabling field and design personnel access to distribution data in a single computerized system. With continuous updates, distribution system information will improve and ultimately provide more accurate information for field work and hydraulic modeling of the distribution system. In CY8, updates included emphasis on updating locations of past capital work while also maintaining information that is occurring on a daily basis. Veolia worked with Watts Architecture and Engineering to develop the electronic file transfer format that will be used to transfer as-builts into the system.

Employee health and safety remains paramount. Safety systems are continuously upgraded throughout all areas of the operation including, but not limited to, confined space entry, office ergonomics, chemical handling, mechanized equipment, and excavation safety. During CY8 Veolia offered Defensive Driving Course and Certified Excavator Training to Buffalo Water employees. In partnership with the City, health and safety also included work place violence prevention and diversity awareness training. Veolia continues to invest in the equipment and training processes with the goal that Veolia and City personnel continue to assume ownership of their own health and safety, and that of their coworkers.

## ❖ **Pumping and Treatment Plant Activity**

Similar to previous years, considerable operations and maintenance work was performed by City personnel, as well as contractor labor to augment the City workforce. Contract labor was procured for the following:

- Centrifuge Operations
- Pump and Valve Maintenance
- Electrical Service Work
- Service on Treatment Process Instrumentation
- Chlorine Gas System Preventative Maintenance

Residuals handling and dewatering operations for the 2018 season commenced in April and were completed in early October. Approximately 1,732 wet tons of dewatered residuals were removed, processed and subsequently disposed during the 2018 residuals processing season.

Structural repairs were made to the West wall of the stone storage area due degradation of the exterior brick wythe. The majority of the outer wythe was removed and rebuilt with new brick and tied into the second wythe for increased structural support. Flashing improvements as well as sealing of terracotta corners were also part of the overall repair project.

The administration area of Colonel Ward as well the Head House and laboratory of the filtration plant underwent an asbestos abatement and renovation project. The work is expected to be complete during the second quarter of CY9, and will provide much improve facilities for both administrative and laboratory functions.

Efforts were made by City personnel to removal abandoned process piping and equipment that is no longer used in the treatment process. Part of this work included decommissioning of the flow tube pit and associated equipment located in the basement of the head house. Due to the complex nature of the work, Allied Environmental Services was contracted to assist with equipment removal.

Hazardous materials management was again a priority during CY8. All materials were removed from the site, and a 90-day cycle of waste identification and removal established with Allied Environmental Services moving forward.

A pipe loop test rig was constructed in the maintenance area to enable testing of various chemicals to estimate corrosive effects on lead and copper. This apparatus is used to simulate actual service lines that are found in the service territory, providing actual empirical data in a testing environment, prior to implementing full scale chemical changes. During CY8, the system was commissioned and was operated by graduate students from SUNY Buffalo. It is anticipated that this partnership with SUNY Buffalo will continue for several years.



## ❖ **Water Distribution**

City personnel were actively involved in distribution maintenance and repair during CY8. Contract labor was utilized to supplement City labor in performing timely repairs and minimizing service interruptions.

The number of main breaks handled and repaired during CY8 decreased to 336, from the contract year seven (CY7) total of 371.

A total of 3192 hydrants were repaired, and 136 hydrants were replaced in CY8.

During CY8, hydrant painting and flagging efforts continued with 5,315 hydrants painted during CY8. Painting hydrants is not only aesthetic, but the color of the paint also serves as an indicator for high flow hydrants for firefighting services. The hydrant painting and flagging program will extend into CY9 to include the remainder of the service area.

Routine and continuous hydrant flushing was conducted throughout the service area to maintain water quality. Annual hydrant inspections ensure proper operation of assets.

## ❖ **Fleet**

The condition of the fleet is exceptional, with 30 vehicles in the Buffalo Water service fleet being replaced. The overall program has resulted in a newer, more reliable fleet with minimal downtime as preventive fleet maintenance has displaced reactive maintenance. This program will ensure continued fleet reliability for subsequent contract years.

## ❖ **Customer Service**

Throughout CY8 Veolia has remained committed to the growth and stability of the Customer Service Department. As in previous years we have successfully sustained our current operations while continuously looking for new and innovative approaches to improve the utility's customer service experience. Listed below are key accomplishments for CY8.

- Technology Enhancements
- Increased Employee Training Initiatives
- Technical Infrastructure Upgrades
- Improved Call Center KPI's (key performance indicators)

The Customer Service Department closed-out CY8 by answering 99% of the calls offered to the group. Sustained staffing levels, consistent training initiatives and minimal employee attrition has had a positive impact on the group maintaining this high level of service throughout CY8. The table below presents a comparison of key performance indicators (KPIs) for Contract years, 6, 7 and 8 within the customer service group.

<u>Contact Year</u>	<u>Total Calls Offered</u>	<u>Total Calls Answered</u>	<u>% Call Answered</u>	<u>Average Speed to Answer</u>
CY6	71,905	70,162	98%	1:06 seconds
CY7	68,054	66,831	98%	1:02 seconds
CY8	64,162	63574	99%	1:02 seconds

As the knowledge base of our CSR's continues to grow, the ratio of customer inquiries that is resolved during the initial call has increased. Based on these improvements our incoming call volume has decreased by 3, 892 calls in CY8.

### ❖ **Billing and Collection**

Water service collections for CY8 totaled \$ 39.5 million; Revenues were slightly below the five year average of \$40 million as cooler weather during the first three months of CY8 adversely impacted billing and collections.

In CY8, various initiatives were implemented to increase revenue for Buffalo Water during the year as outlined below:

- Veolia conducted a small meter change out program with Buffalo Water that was a continuation of the program that was started last year by a third party vendor. This program concentrated in South Buffalo, an area that had not yet been reached by last year's program. A total of 403 accounts were identified that the meter was either recording a zero actual consumption while the customer continued to pay only base charges or estimated accounts where it appeared that the meter had stopped functioning. Over 70% of the meters have been changed out and actual consumption is being recorded with the appropriate water charges being applied to the account.
- A large meter change out program was also performed during the year as two very large users of water were refitted with meters in line with their consumption profiles. Correct metering equipment is needed to ensure water flow is measured at all usage levels. Correct metering also ensures all water is recorded and billed appropriately. The Buffalo Board of Education was also evaluated for meter equipment update as 25 accounts were identified to have the unit measuring equipment or UME changed out to accurately record water volumes at all pressures.
- Veolia also finalized a Backflow program that will provide an annual reminder to customers that have a backflow device on their meter to have the equipment inspected. The annual inspection of backflow preventers is an important component in the protection of water quality safety from the migration of contamination back into Buffalo Water's main service lines at the point of interconnection with the end user. The program will also identify those accounts that require a backflow preventer which currently do not have one based on the size of the meter or if it is connected to a fire supply service.

### ❖ **Community Participation**

Veolia continued sponsorship of the Mayor Byron W. Brown Reading Rules program. Furthermore, Veolia and Buffalo Water representatives visited Block Clubs and local libraries to distribute information and promote water awareness. Veolia supports new and innovative programs to increase water testing in all neighborhoods throughout the City.

# Compliance Summary

## COMPLIANCE SUMMARY

Below is a summary of all compliance related reports that have been filed and active permits with a regulatory agency.

### Current Permits

- B.P.D.E.S. Permit No. 14-04-BU251
  - Discharge supernatant from centrifuge sludge dewatering
  - Expired on June 30, 2017 and was renewed through June 30, 2020
- S.P.D.E.S. Permit No. NY 003 2174
  - Discharge from Outfalls 001, 003A, 004, 005, 006, 007, & 009
  - Expired on April 30, 2016 and was renewed through April 30, 2021

### Regulatory Reports

- The 2017 Tier II HazMat report was signed and submitted February 20, 2018.
- 2018 Outfall Report was filed with NYSDEC.
- 2018 Water Withdrawal Report was filed with NYSDEC on May 1, 2018.
- A copy of the 2017 Consumer Confidence Report (CCR) was made available to all customers prior to the May 31, 2017 due date. A copy of the CCR can be found at:  
<http://www.buffalowater.org/Quality/WaterQualityReports/20172018WaterQualityReport>

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
State Pollutant Discharge Elimination System (SPDES)  
NOTICE / RENEWAL APPLICATION / PERMIT



Please read ALL instructions on the back before completing this application form. Please TYPE or PRINT clearly in ink.

PART 1 - NOTICE

06/15/2010

Permittee Contact Name, Title, Address

Facility and SPDES Permit Information

BUFFALO (C) DPW-DIV.OF WATER  
~~JOSEPH GIAMBRA~~ STEVEN STEPNIAK  
502 CITY HALL  
BUFFALO NY 14202

Name: BUFFALO (C) WATER T P & COL WARD  
Ind. Code: 4941 County: ERIE  
DEC No.: 9-1402-00164/00001  
SPDES No.: NY 003 2174  
Expiration Date: 04/30/2011  
Application Due By: 11/01/2010

Are these name(s) & address(es) correct? if not, please write corrections above.

The State Pollutant Discharge Elimination System Permit for the facility referenced above expires on the date indicated. You are required by law to file a complete renewal application at least 180 days prior to expiration of your current permit. Note the "Application Due By" date above.

CAUTION: This short application form and attached questionnaire are the only forms acceptable for permit renewal. Sign Part 2 below and mail only this form and the completed questionnaire using the enclosed envelope. Effective April 1, 1994 the Department no longer assesses SPDES application fees.

If there are changes to your discharge, or to operations affecting the discharge, then in addition to this renewal application, you must also submit a separate permit modification application to the Regional Permit Administrator for the DEC region in which the facility is located, as required by your current permit. See the reverse side of this page for instructions on filing a modification request.

PART 2 - RENEWAL APPLICATION

CERTIFICATION: I hereby affirm that under penalty of perjury that the information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to section 210.45 of the Penal Law

LAWRENCE D. GOLDSMITH  
Name of person signing application (see instructions on back)

OPERATIONS MANAGER - VEOLIA WATER NA  
Title

*Lawrence D. Goldsmith*  
Signature

10/20/2010  
Date

PART 3 - PERMIT (Below this line - Official Use Only)

Effective Date: 5/1/11 Expiration Date: 4/30/16

Stuart Fox  
Permit Administrator

Address: NYSDEC - Division of Environmental Permits  
Bureau of Environmental Analysis  
625 Broadway, Albany, NY 12233-1750

*Stuart M. Fox*  
Signature

10/20/2010  
Date

This permit together with the previous valid permit for this facility issued 5/1/06 and subsequent modifications constitute authorization to discharge wastewater in accordance with all terms, conditions and limitations specified in the previously issued valid permit, modifications thereof or issued as part of this permit, including any special or general conditions attached hereto. Nothing in this permit shall be deemed to waive the Department's authority to initiate a modification of this permit on the grounds specified in 6NYCRR §621.14, 6NYCRR §754.4 or 6NYCRR §757.1 existing at the time this permit is issued or which arise thereafter.

Attachments: General Conditions dated \_\_\_\_\_

80:2 HJ 52 10001  
10 OCT 25 PM 2:08

RECEIVED  
ENVIRONMENTAL SYSTEMS





NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
**State Pollutant Discharge Elimination System (SPDES)**  
**DISCHARGE PERMIT**  
Special Conditions

FWS/3.99

Industrial Code: 4941  
Discharge Class (CL): 4  
Toxic Class (TX):  
Major Drainage Basin: 01  
Sub Drainage Basin: 01  
Water Index Number: Black Rock Canal  
Compact Area:

SPDES Number: NY-0032174  
DEC Number: 9-1402-00164/00001  
Effective Date (EDP): 5/01/2006  
Expiration Date (ExDP): 4/30/2011  
Modification Dates:(EDPM) 12/01/2006

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

**PERMITTEE NAME AND ADDRESS**

Name: City of Buffalo Dept. Of Public Works, Division of Water Attention: Joseph Giambra  
Street: 502 City Hall  
City: Buffalo State: NY Zip Code: 14202

is authorized to discharge from the facility described below:

**FACILITY NAME AND ADDRESS**

Name: City of Buffalo WTP & Colonel Ward Pump Station  
Location (C,T,V): Buffalo County: Erie  
Facility Address: 2 Porter Avenue  
City: Buffalo State: NY Zip Code: 14201  
NYTM -E: 181.5 NYTM - N: 4756.7  
From Outfall No.: 001 at Latitude: 42 ° 53 ' 30 " & Longitude: 78 ° 51 ' 00 "  
into receiving waters known as: Black Rock Canal Class: C

and; (list other Outfalls, Receiving Waters & Water Classifications)  
003A, 004, 005, 006, 007, & 009

in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth this permit;  
and 6 NYCRR Part 750-1.2(a) and 750-2.

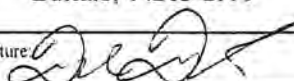
**DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS**

Mailing Name: American Water Services, Inc.  
Street: 2 Porter Avenue  
City: Buffalo State: NY Zip Code: 14201  
Responsible Official or Agent: Jim Campolong - Project Manager AWS Inc. Phone: (716) 852 0499

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION:

NYSDEC Regional Water Engineer  
NYSDEC Bureau of Water Permits, Albany  
USEPA, Reg 2: Attention Jeff Gratz  
Erie County Department of Environment and Planning

Permit Administrator: David S. Denk	
Address: 270 Michigan Avenue Buffalo, 14203-2999	
Signature: 	Date: 10/26/06

PERMIT LIMITS, LEVELS AND MONITORING (continued)

FINAL PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
001 & 004	Groundwater and Potable Water From Clear Wells	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
Flow	monitor	monitor	gpd	Daily During Discharge Event	Estimate	
pH	6.5	9.0	SU	Daily During Discharge Event	grab	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
003A <sup>1</sup> (thickner effluent)	Discharge of Decant Water from Sand Filter Backwash Thickener (to Outfall No. 003)	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
pH	6.0	9.0	SU	Daily	Grab	

PARAMETER	COMPLIANCE LIMIT		MONITORING ACTION LEVEL		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg.	Daily Max.	TYPE I	TYPE II				
Flow	monitor	9.17			MGD	Continuous	Chart Recording Flow Meter	
Total Suspended Solids	20	40			mg/l	Monthly	Composite	
Settleable Solids		0.1			ml/l	Monthly	Grab	
Total Chlorine Residual		0.25			mg/l	Daily	Grab	
Aluminum (Dissolved)				1.0	mg/l	Monthly	Composite	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
005	Stormwater Runoff	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
Flow	monitor	monitor	gpd	Daily During Discharge Events	Estimate	

<sup>1</sup>Discharge of untreated sand filter backwash water via. Outfall Nos. 002 and 003 is not authorized.

PERMIT LIMITS, LEVELS AND MONITORING (continued)

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
006	Washwater From Course Traveling Screens & Stormwater	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
Flow	monitor	monitor	gpd	Daily During Discharge Events	Estimate	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
007	Stormwater & Emergency Use For Flood Relief For Colonel Ward PS	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
Flow	monitor	monitor	gpd	Daily During Discharge Event	Estimate	

OUTFALL No.	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
009	Ground Water And Emergency Discharge Of Potable Water	Black Rock Canal	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
Flow	monitor	monitor	gpd	Daily During Discharge Event	Estimate	
pH	6.5	9.0	SU	Daily During Discharge Event	Grab	

PERMIT LIMITS, LEVELS AND MONITORING (continued)

Effective Date of Permit: EDP

DISCHARGE NOTIFICATION REQUIREMENTS

- (a) Except as provided in (c), (f) and (g) of these Discharge Notification Act requirements, the permittee shall install and maintain identification signs at all outfalls to surface waters listed in this permit. Such signs shall be installed before initiation of any discharge.
- (b) Subsequent modifications to or renewal of this permit does not reset or revise the deadline set forth in (a) above, unless a new deadline is set explicitly by such permit modification or renewal.
- (c) The Discharge Notification Requirements described herein do not apply to outfalls from which the discharge is composed exclusively of storm water, or discharges to ground water.
- (d) The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty four inches (18" x 24") and shall have white letters on a green background and contain the following information:

N.Y.S. PERMITTED DISCHARGE POINT

SPDES PERMIT No.: NY \_\_\_\_\_

OUTFALL No. : \_\_\_\_\_

For information about this permitted discharge contact:

Permittee Name: \_\_\_\_\_

Permittee Contact: \_\_\_\_\_

Permittee Phone: (     ) - ### - ####

OR:

NYSDEC Division of Water Regional Office Address :

NYSDEC Division of Water Regional Phone: (     ) - ### - ####

- (e) For each discharge required to have a sign in accordance with a), the permittee shall, concurrent with the installation of the sign, provide a repository of copies of the Discharge Monitoring Reports (DMRs), as required by the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of this permit. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be at the business office repository of the permittee or at an off-premises location of its choice (such location shall be the village, town, city or county clerk's office, the local library or other location as approved by the Department). In accordance with the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of your permit, each DMR shall be maintained on record for a period of three years.

**PERMIT LIMITS, LEVELS AND MONITORING** (continued)

(continued)

- (f) If, upon November 1, 1997, the permittee has installed signs that include the information required by 17-0815-a(2)(a) of the ECL, but do not meet the specifications listed above, the permittee may continue to use the existing signs for a period of up to five years, after which the signs shall comply with the specifications listed above.
- (g) All requirements of the Discharge Notification Act, including public repository requirements, are waived for any outfall meeting any of the following circumstances, provided Department notification is made in accordance with (h):
  - (i) such sign would be inconsistent with any other state or federal statute;
  - (ii) the Discharge Notification Requirements contained herein would require that such sign could only be located in an area that is damaged by ice or flooding due to a one-year storm or storms of less severity;
  - (iii) instances in which the outfall to the receiving water is located on private or government property which is restricted to the public through fencing, patrolling, or other control mechanisms. Property which is posted only, without additional control mechanisms, does not qualify for this provision;
  - (iv) instances where the outfall pipe or channel discharges to another outfall pipe or channel, before discharge to a receiving water; or
  - (v) instances in which the discharge from the outfall is located in the receiving water, two-hundred or more feet from the shoreline of the receiving water.
- (h) If the permittee believes that any outfall which discharges wastewater from the permitted facility meets any of the waiver criteria listed in (g) above, notification (form enclosed) must be made to the Department's Bureau of Water Permits, Central Office, of such fact, and, provided there is no objection by the Department, a sign and DMR repository for the involved outfall(s) are not required. This notification must include the facility's name, address, telephone number, contact, permit number, outfall number(s), and reason why such outfall(s) is waived from the requirements of discharge notification. The Department may evaluate the applicability of a waiver at any time, and take appropriate measures to assure that the ECL and associated regulations are complied with.
- (i) The permittee shall periodically inspect the outfall identification signs in order to ensure that they are maintained, are still visible and contain information that is current and factually correct.

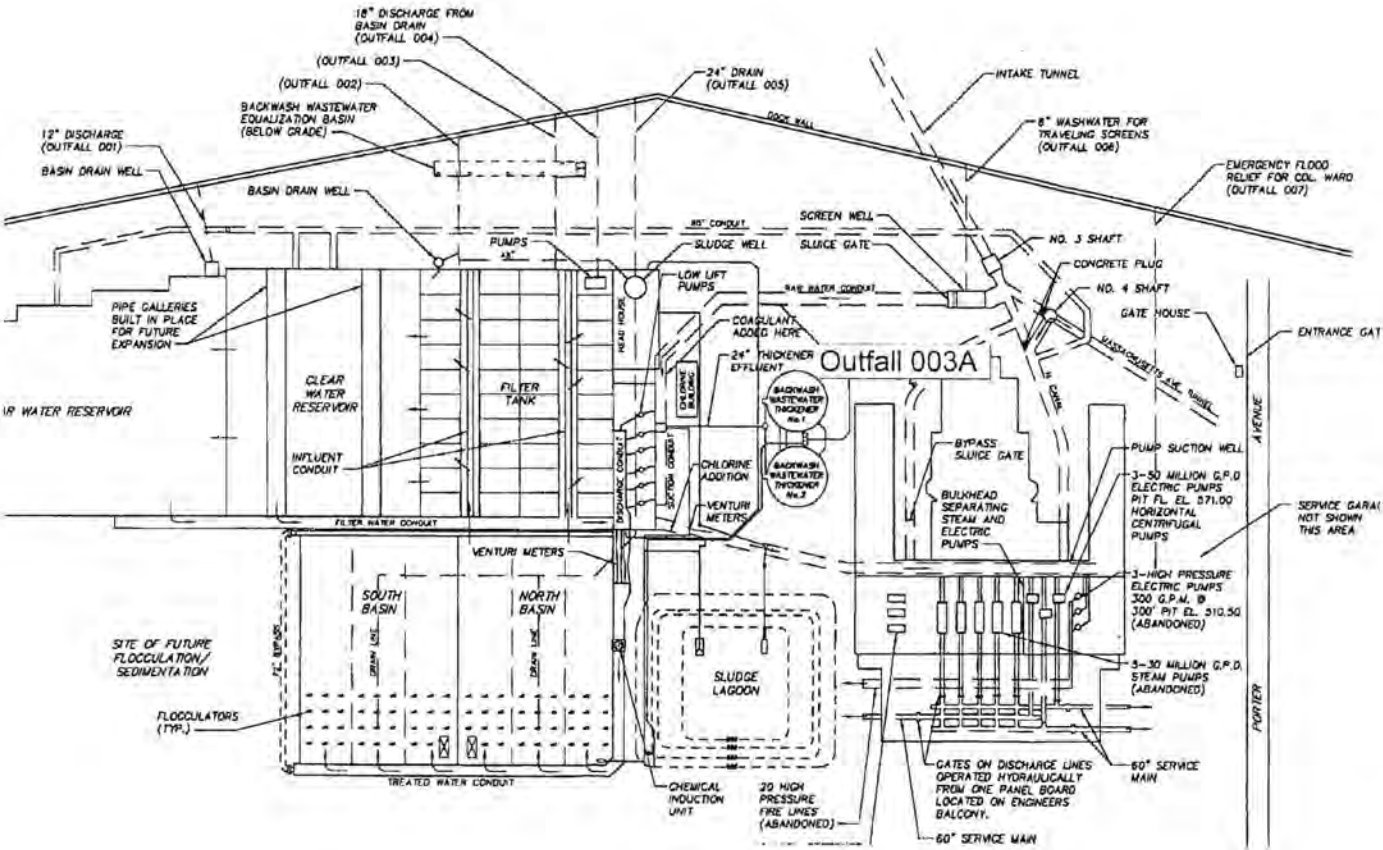


PERMIT LIMITS, LEVELS AND MONITORING (continued)

C:\Documents and Settings\rsm\My Documents\Correl User Files\Wpfiles\SPDES Permits\Buffalo WTP\BuffaloWTPSPDES5\_10\_06.wpd

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) specified below:



**PERMIT LIMITS, LEVELS AND MONITORING** (continued)

Effective Date: 3/1/07

Expiration Date: 4/30/07

**RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS**

- a) The permittee shall also refer to 6 NYCRR Part 750-1.2(a) and 750-2 for additional information concerning monitoring and reporting requirements and conditions.
- b) The monitoring information required by this permit shall be summarized, signed and retained for a period of three years from the date of the sampling for subsequent inspection by the Department or its designated agent. **Also, monitoring information required by this permit shall be summarized and reported by submitting;**

☐ (if box is checked) completed and signed Discharge Monitoring Report (DMR) forms for each \_\_\_\_ month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.

☒ (if box is checked) an annual report to the Regional Water Engineer at the address specified below. The annual report is due by February 1 and must summarize information for January to December of the previous year in a format acceptable to the Department.

☐ (if box is checked) a monthly "Wastewater Facility Operation Report..." (form 92-15-7) to the:

☐ Regional Water Engineer and/or ☐ County Health Department or Environmental Control Agency specified below

Send the **original** (top sheet) of each DMR page to:

Department of Environmental Conservation  
Division of Water  
Bureau of Watershed Compliance Programs  
625 Broadway  
Albany, New York 12233-3506

Phone: (518) 402-8177

Send the **first copy** (second sheet) of each DMR page to:

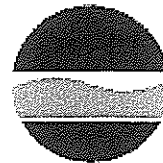
Department of Environmental Conservation  
Regional Water Engineer  
270 Michigan Avenue  
Buffalo, NY 14203-2999  
Phone: 716-851-7070

Send an **additional copy** of each DMR page to:

- c) Noncompliance with the provisions of this permit shall be reported to the Department as prescribed in 6 NYCRR Part 750-1.2(a) and 750-2.
- d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.
- e) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculations and recording of the data on the Discharge Monitoring Reports.
- f) Calculation for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.
- g) Unless otherwise specified, all information recorded on the Discharge Monitoring Report shall be based upon \_\_\_\_ measurements and sampling carried out during the most recently completed reporting period.
- h) Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section five hundred two of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be sent to the Environmental Laboratory Accreditation Program, New York State Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller Empire State Plaza, Albany, New York 12201.



New York State Department of Environmental Conservation  
Division of Environmental Permits  
NYSDEC HEADQUARTERS  
625 BROADWAY  
ALBANY, NY 12233  
(518) 402-9167



**SPDES PERMIT RENEWAL**

12/8/2015

Douglas Furtz  
Buffalo Water / Veolia  
2 Porter Ave  
Buffalo NY 14201

Permittee Name: CITY OF BUFFALO  
Facility Name: BUFFALO WATER PLT & COL WARD PS  
Ind. Code: 4941 County: ERIE  
DEC ID: 9-1402-00164/00001 SPDES No.: NY0032174  
Permit Effective Date: 5/1/2016  
Permit Expiration Date: 4/30/2021

Dear Permittee,

The State Pollutant Elimination System (SPDES) permit renewal for the facility referenced above is approved with the new effective and expiration dates. This letter together with the previous valid permit for this facility effective on 05/01/2011 and any subsequent modifications constitute authorization to discharge wastewater in accordance with all terms, conditions and limitations specified in the previously issued permit(s).

As a reminder, SPDES permits are renewed at a central location in Albany in order to make the process more efficient. All other concerns with your permit, including applications for permit modification or transfer to a new owner, a name change, and other questions, should be directed to:

Regional Permit Administrator  
NYSDEC Region 9 Headquarters  
270 Michigan Ave  
Buffalo, NY 14203-2915  
(716) 851-7165

If you have already filed an application for modification of your permit, it will be processed separately by that office.

If you have questions concerning this permit renewal, please contact LINDY SUE CZUBERNAT at (518) 402-9167.

Sincerely,

A handwritten signature in black ink that reads "Stuart M. Fox".

Stuart M. Fox  
Deputy Chief Permit Administrator

CC:  
RPA  
BWC

RWE  
File

BWP



**ADMINISTRATIVE OFFICES**

1038 CITY HALL  
65 NIAGARA SQUARE  
BUFFALO, NY 14202-3378  
PHONE: (716) 851-4664  
FAX: (716) 856-5810

**WASTEWATER TREATMENT PLANT**

FOOT OF WEST FERRY  
90 WEST FERRY STREET  
BUFFALO, NY 14213-1799  
PHONE: (716) 851-4664  
FAX: (716) 883-3789

January 16, 2017

Mr. Douglas Fultz  
Operations Manager  
Veolia/Buffalo Water Authority  
2 Porter Avenue  
Buffalo, New York 14201



**RE: B.P.D.E.S. Permit #17-07-BU251**

Dear Mr. Fultz:

Enclosed is your new BPDES Permit #17-07-BU251. This permit is issued by the Buffalo Sewer Authority.

This original permit must be maintained at your Buffalo Water Authority facility and must be available for inspection at all times. It is your responsibility to assure continual compliance with the terms and conditions of this permit. Finally, you must apply for renewal at least 6 months before this permit expires.

If you have any further questions, please call Mike Szilagyi at 716-851-4664, ext. 5253.

Very truly yours,  
BUFFALO SEWER AUTHORITY

Leslie Sedita  
Industrial Waste Administrator

cc: M. Letina  
M.Szilagyi

**AUTHORIZATION TO DISCHARGE UNDER THE BUFFALO  
POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**PERMIT NO. 17-07-BU251  
EPA Category 40 CRF 403**

In accordance with the provisions of the Federal Water Pollution Control Act, as amended, and the Sewer Regulations of the Buffalo Sewer Authority, authorization is hereby granted to:

**Veolia Water North America, LLC. /Buffalo Water Authority**

to discharge **supernatant from centrifuge sludge dewatering** from a facility located at:

**2 PORTER AVENUE, BUFFALO, N.Y. 14202**

to the Buffalo Municipal Sewer System.

Issuance of this permit is based upon a permit application filed on **December 27, 2016** and analytical data. This permit is granted in accordance with discharge limitations, monitoring requirements and other conditions set forth in Parts I and II hereof.

**Effective this 1<sup>st</sup> day of July, 2017**

**To Expire the 30<sup>th</sup> day of June, 2020**

  
General Manager

Signed this 20<sup>th</sup> day of January, 2017

## PART I: SPECIFIC CONDITIONS

### A. DISCHARGE LIMITATIONS & MONITORING REQUIREMENTS

During the period beginning the effective date of this Permit and lasting until the expiration date, discharge from the permitted facility outfall (see attached map) shall be limited and monitored **Quarterly** by the permittee as specified below.

Sample Point	Parameter	Discharge Limitations		Sampling Requirements	
		Daily Max <sup>(2)</sup>	M.A.I.D. <sup>(1)</sup>	Period <sup>(2)</sup>	Type
001	pH	5.0-12.0 S.U.	-----	3 Day	Composite
	Total Suspended Solids	over 250 mg/L surchargeable.	-----	3 Day	Composite
	Total Solids	Monitor only	-----	3 Day	Composite
	Total Phosphates	Over 250 mg/L surchargeable	-----	3 Day	Composite
	Total Flow	100 gals. per minute, 150,000 gallons maximum	-----	Continuous	Meter <sup>(3)</sup>
	Total Aluminum <sup>(6)</sup>	Monitor only	-----	3 Day	Composite
	Total Arsenic	2.25 lbs	1.8 mg/L	3 Day	Composite
	Total Barium	1.25 lbs	1.00 mg/L		
	Total Cadmium	1.25 lbs	40.0 mg/L	3 Day	Composite
	Total Chromium	6.25 lbs	40.0 mg/L	3 Day	Composite
	Total Copper	20.0 lbs	16.0 mg/L	3 Day	Composite
	Total Lead	6.25 lbs	65.0 mg/L	3 Day	Composite
	Total Mercury	.001 lbs	0.0008 mg/L	3 Day	Composite
	Total Nickel	17.5 lbs	14.0 mg/L	3 Day	Composite
	Total Selenium	1.25 lbs	1.0 mg/L	3 Day	Composite
	Total Silver	2.75 lbs	2.2 mg/L	3 Day	Composite
	Total Zinc	31.25 lbs	25.0 mg/L	3 Day	Composite
	EPA Test Method 624	(5)	-----	1 Day	Grab <sup>(4)</sup>
	EPA Test Method 625	(5)	-----	1 Day	Composite

1. Maximum Allowable Instantaneous Discharge – M.A.I.D. (slug limits)
2. Daily Max. Discharge Limits based on 150,000 gallons/day.
3. Daily discharge flow charts or meter readings must be available for inspection upon request. Discharge flow meter must be calibrated once each year in accordance with manufactures specifications.
4. Four equally spaced grab samples during discharge day
5. Sampling and analytical date for EPA Test Methods 624 and 625 must be submitted with the initial monitoring report. The permittee is not authorized to discharge any compound evaluated by these test procedures, which may cause or contribute to a violation of the BSA's Local Limits of water quality standards, worker health and safety limits and/or harm the sewerage systems. Any compounds detected may, at the discretion of the Buffalo Sewer authority, be specifically limited and incorporated into this permit. Additional scans may be required if other compounds are suspected to be present in the discharge.
6. A daily maximum discharge limit will be calculated for this parameter once a M.A.I.D. limit has been established for the Treatment Plant

**PART I: SPECIFIC CONDITIONS****B. DISCHARGE MONITORING REPORTING REQUIREMENTS**

During the period beginning the effective date of this permit and lasting until the expiration date, discharge monitoring results shall be summarized and reported **quarterly** by the permittee dates specified below:

Sample Point	Parameter	Reporting Requirements	
		Initial Report	Subsequent Reports
001	All parameters	4 weeks after 1 <sup>st</sup> discharge	Quarterly (1) (2)

1. Should the initial monitoring report indicate levels approaching the daily maximum limit, monthly sampling and reporting will be required. The Buffalo Sewer Authority will notify the permittee in this event.
2. Once the initial monitoring report is submitted the BSA will revise this page to state the subsequent report due dates.

## PART I: SPECIFIC CONDITIONS

### C. SPECIAL REQUIREMENTS

Veolia Water North America, LLC (VWNA) / Buffalo Water Authority shall inform the Buffalo Sewer Authority (BSA) **thirty (30) days prior to** commencement of this discharge. If during discharge, the BSA requests the discharge to cease, then VWNA will cease discharge immediately. Discharge is prohibited during wet weather events. The BSA will have the option to inspect the discharge concentration so that the length of discharge can be determined.

The BSA reserves the right to suspend these discharges at anytime. The BSA will not be held obligated to accept the supernatant from centrifuge sludge dewatering if it has any deleterious effect on the sewerage system. The BSA will have at their option an onsite coordinator to oversee the discharge and all monitoring performed.

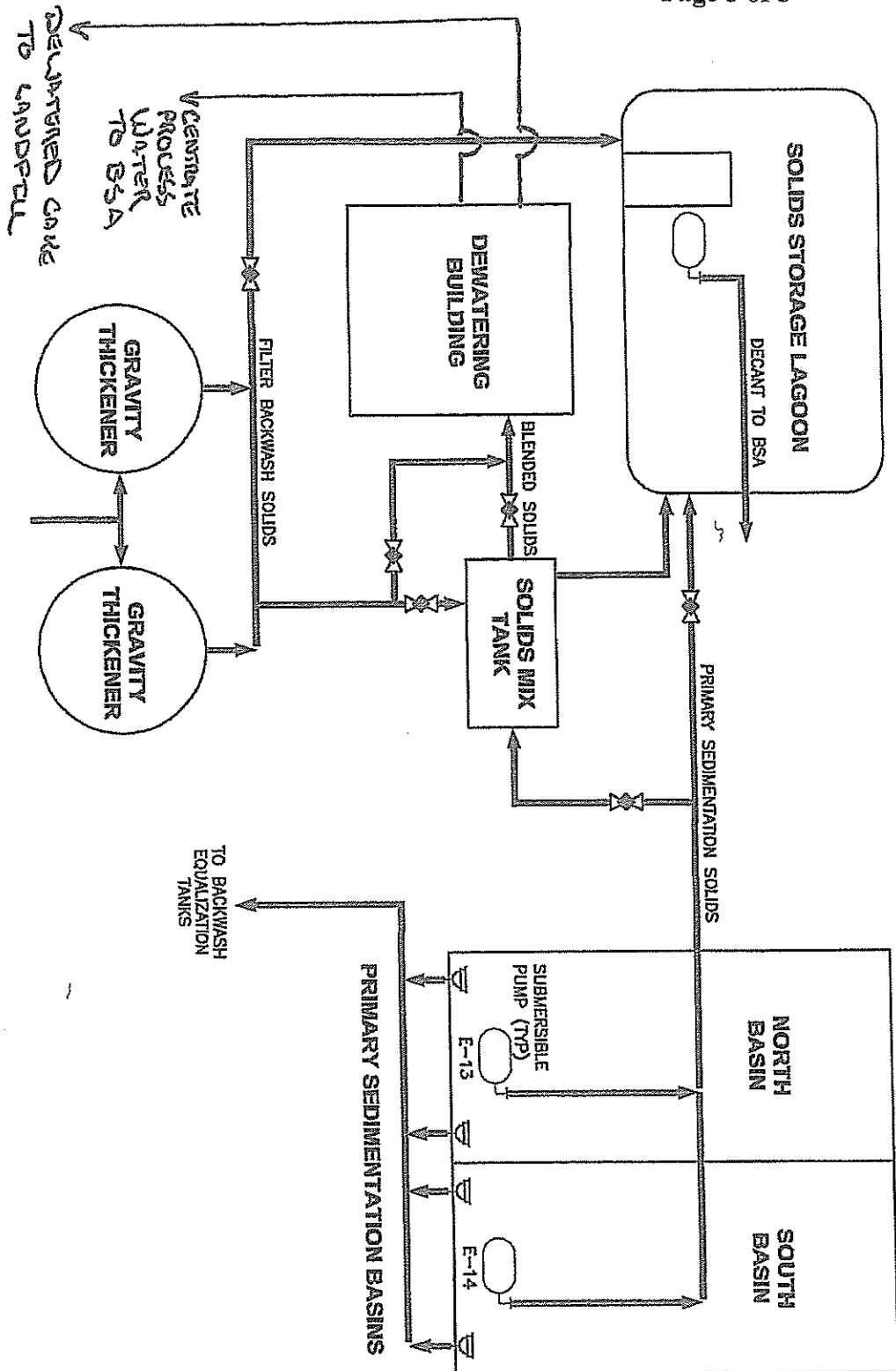
Any analytical costs incurred by the BSA for sampling it performs will be assessed to the permittee. All costs associated with the conveyance and treatment of the wastestream will be determined by the "Schedule of Sewer Rents and Other Charges" in effect during the discharge period.

**Permit No. 17-07-BU251**

**Part I**

**Page 5 of 5**





**BUFFALO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT**  
**PART II: GENERAL CONDITIONS**

**A. MONITORING AND REPORTING**

**1. Local Limits**

Except as otherwise specified in this permit, the permit holder shall comply with all specific prohibitions, limits on pollutants or pollutant parameters set forth in the Buffalo Sewer Authority Sewer Use Regulations, as amended from time to time, and such prohibitions, limits and parameters shall be deemed pretreatment standards for purposes for the Clean Water Act.

**2. Definitions**

Definitions of terms contained in this permit are as defined in the Buffalo Sewer Authority Sewer Use Regulations.

**3. Discharge Sampling Analysis**

All Wastewater discharge samples and analyses and flow measurements shall be representative of the volume and character of the monitored discharge. Methods employed for flow measurements and sample collections and analyses shall conform to the Buffalo Sewer Authority "Sampling Measurement and Analytical Guidelines Sheet".

**4. Recording of Results**

For each measurement or sample taken pursuant to the requirements of the permit, the permittee shall record the information as required in the "Sampling Measurement and Analytical Guidelines Sheet".

**5. Additional Monitoring by Permittee**

If the permittee monitors any pollutants at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in 40 CFR Part 136 the results of such monitoring shall be included in the calculation and reporting of values required under Part I, B. Such increased frequency shall also be indicated.

**6. Reporting**

All reports prepared in accordance with this Permit shall be submitted to:

**Industrial Waste Section  
Buffalo Sewer Authority Treatment Plant  
90 West Ferry Street  
Buffalo, New York 14213**

All self-monitoring reports shall be prepared in accordance with the BSA "Sampling Measurement and Analytical Guidelines Sheet". These reporting requirements shall not relieve the permittee of any other reports, which may be required by the N.Y.S.D.E.C. or the U.S.E.P.A.

**7. Certification Statement**

All self-monitoring reports shall include the following certification statement, signed by the preparer of the report:

*"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the systems, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".*

**B. PERMITTEE REQUIREMENTS**

**1. Change in Discharge**

All discharges authorized herein shall be consistent with the terms and conditions of this permit and with the information contained in the BPDES permit application on which basis this permit is granted. In the event of any facility expansions, production increases, process modifications or the installation, modification or repair of any pretreatment equipment which may result in new, different or increased discharges of pollutants, a new BPDES Permit application must be submitted prior to any change. Following receipt of an amended application, the BSA may modify this permit to specify and limit any pollutants not previously limited. In the event that the proposed change will be covered under an applicable Categorical Standard, a Baseline Monitoring Report must be submitted at least ninety (90) days prior to any discharge.

**2. Records Retention**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained at this facility for a minimum of three (3) years, or longer if requested by the General Manager.

**3. Slug Control Plan**

Upon written notification by the BSA that a slug control plan is necessary for the permittee, the plan shall be prepared in accordance with the BSA "Sampling Measurement and Analytical Guidelines" sheet. Within 90 days of the BSA notification, the permittee must implement the slug control plan

**4. Notification of Slug, Accidental Discharge or Spill**

In the event that a slug, accidental discharge or any spill occurs at the facility for which this permit is issued, it is the responsibility of the permittee to immediately notify the B.S.A. Treatment Plant of the quantity and character of such discharge. During normal business hours, Monday – Friday, 7:30 AM - 3:00 PM call 716-851-4664, ext. 5374. After normal business hours call 716-851-4664, ext. 600. For all slug discharges, and when requested by the BSA following an accidental discharge or spill, within five (5) days following all such discharges, the permittee shall submit a report describing the character and duration of the discharge, the cause of the discharge, and measures taken or that will be taken to prevent a recurrence of such discharge.

**5. Noncompliance Notification**

If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitation specified in this permit, the permittee or their assigns must verbally notify the Industrial Waste Section at 716-851-4664 ext. 5374 within twenty-four (24) hours of becoming aware of the violation. The permittee shall provide the Industrial Waste Section with the following information, in writing, within five (5) days of becoming aware of such condition:

- a. a description of the discharge and cause of noncompliance and;
- b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the non-complying discharge.

Additionally, the permittee shall repeat the sampling and analysis and submit these results of the report analysis to the Industrial Waste Section within 30 days after becoming aware of the violation.

**6. Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to the Buffalo Sewerage System resulting from noncompliance with any discharge limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

**7. Waste Residuals**

Solids, sludges, filter backwash or other pollutants removed in the course of treatment or control of wastewaters and/or the treatment of intake waters, shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the Buffalo Sewer System.

**8. Power Failures**

In order to maintain compliance with the discharge limitations and prohibitions of this permit, the permittee shall provide an alternative power source sufficient to operate the wastewater control facilities; or, if such alternative power source is not provided the permittee shall halt, reduce or otherwise control production and/or controlled discharges upon the loss of power to the wastewater control facilities.

**9. Treatment Upsets**

- a. Any industrial user which experiences an upset in operations that places it in a temporary state of noncompliance, which is not the result of operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation, shall inform the Industrial Waste Section immediately upon becoming aware of the upset. Where such information is given verbally, a written report shall be filed by the user within five (5) days. The report shall contain:
  - (i) A description of the upset, its cause(s) and impact on the discharger's compliance status;
  - (ii) The duration of noncompliance, including exact dates and times of noncompliance, and if the non-compliance is continuing, the time by which compliance is reasonably expected to be restored;
  - (iii) All steps taken or planned to reduce, eliminate, and prevent recurrence of such an upset.
- b. An industrial user which complies with the notification provisions of this Section in a timely manner shall have an affirmative defense to any enforcement action brought by the Industrial Waste Section for any

noncompliance of the limits in this permit, which arises out of violations attributable to and alleged to have occurred during the period of the documented and verified upset.

**10. Treatment Bypasses**

- a. A bypass of the treatment system is prohibited unless the following conditions are met:
  - (i) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; or
  - (ii) There was no feasible alternative to the bypass, including the use of auxiliary treatment or retention of the wastewater; and
  - (iii) The industrial user properly notified the Industrial Waste Section as described in paragraph b. below.
- b. Industrial users must provide immediate notice to the Industrial Waste Section upon discovery of an unanticipated bypass. If necessary, the Industrial Waste Section may require the industrial user to submit a written report explaining the cause(s), nature, and duration of the bypass, and the steps being taken to prevent its recurrence.
- c. An industrial user may allow a bypass to occur which does not cause pretreatment standards or requirements to be violated, but only if it is for essential maintenance to ensure efficient operation of the treatment system. Industrial users anticipating a bypass must submit notice to the Industrial Waste Section at least ten (10) days in advance. The Industrial Waste Section may only approve the anticipated bypass if the circumstances satisfy those set forth in paragraph a. above.

**C. PERMITTEE RESPONSIBILITIES**

**1. Permit Availability**

The originally signed permit must be available upon request at all times for review at the address stated on the first page of this permit.

**2. Inspections**

The permittee shall allow the General Manager of the Buffalo Sewer Authority and/or his authorized representatives, upon the presentation of credentials and during normal working hours or at any other reasonable times, to have access to and copy any records required in this permit; and to sample any discharge of pollutants.

**3. Transfer of Ownership or Control**

In the event of any change in control or ownership of facilities for which this permit has been issued the permit shall become null and void. The succeeding owner shall submit a completed Buffalo Sewer Authority permit application prior to discharge to the sewer system.

**D. PERMITTEE LIABILITIES**

**1. Permit Modification**

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to the following:

- a. Violation of any terms or conditions of this permit,
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts,
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

**2. Imminent Danger**

In the event there exists an imminent danger to health or property, the permitter reserves the right to take immediate action to halt the permitted discharge to the sewerage works.

**3. Civil and Criminal Liability**

Nothing in this permit shall relieve the permittee from any requirements, liabilities, or penalties under provisions of the "Sewer Regulations of the Buffalo Sewer Authority" or any Federal, State and/or local laws or regulations.

**E. NATIONAL PRETREATMENT STANDARDS**

If a pretreatment standard or prohibition (including any Schedule of Compliance specified in such pretreatment standard or prohibition) is established under Section 307 (b) of the Act for a pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with such pretreatment standard or prohibition.



**F. PLANT CLOSURE**

In the event of plant closure, the permittee is required to notify the Industrial Waste Section in writing as soon as an anticipated closure date is determined, but in no case later than five days of the actual closure.

**G. CONFIDENTIALITY**

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Buffalo Sewer Authority. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

**H. SEVERABILITY**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

**BUFFALO SEWER AUTHORITY  
B.P.D.E.S. DISCHARGE PERMIT APPLICATION**

FOR BSA USE ONLY

DATE APPLICATION REC'D: \_\_\_\_\_

INDUSTRIAL NUMBER: \_\_\_\_\_

INVESTIGATOR: \_\_\_\_\_

**PART A - GENERAL INFORMATION**

- A1. Applicant Business Name Veolia | Buffalo Water Authority
- A2. Address of premises discharging wastewater:  
2 Porter Ave. Buffalo NY 14201  
Street City State Zip
- A3a. Business Address (if different than above):  
\_\_\_\_\_  
Street City State Zip
- b. Mailing Address (if different than above):  
\_\_\_\_\_  
Street City State Zip
- A4. Chief Business Official:  
Name: Steven Stepniak Title: Commissioner of Public Works
- A5. Facility Representative:  
Name: David Hill Title: Project Manager Phone: (716) 847-1065 x 214  
Fax: (716) 242-8794 Cell Phone: (270) 570-3040  
E-mail address david.hill3@veolia.com
- A6. Person to be contacted about this application, if different from above:  
Name: Douglas Fultz Title: Operations Manager Phone: (716) 262-6627
- A7. Person to be contacted in case of emergency, if different from above:  
Name: Douglas Fultz Day Phone: (716) 262-6627 Night Phone: (716) 262-6627
- A8. Confidentiality:  
Please indicate those sections of this questionnaire that you wish to remain confidential and your basis for requesting confidentiality.  
\_\_\_\_\_  
\_\_\_\_\_

I have personally examined and am familiar with the information submitted in this document and attachments. Based upon my inquiry of those individuals immediately responsible for obtaining the information reported herein, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information.

12/22/16  
Date

  
Signature of Official (Seal if Applicable)

## PART B - BUSINESS DESCRIPTION

**PURPOSE** The business description is primarily used to determine the substances which may enter into the wastewater discharge from the business activity.

B1. Brief Description: DRINKING WATER TREATMENT AND DISTRIBUTION.

\_\_\_\_\_

\_\_\_\_\_

B2. Business Activity: North American Industry Classification System (NAICS) Codes for Principal Products or Services:

<u>Activity</u>	<u>NAICS Code (5-6 Digits)</u>	<u>Production (Monthly Avg.)*</u>
<u>WATER TREATMENT PLANT</u>	<u>221310</u>	<u>~ 70 MGD</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

B3. Is there a scheduled shutdown? Yes \_\_\_\_\_ No X If yes, when? \_\_\_\_\_

B4. Is production seasonal? Yes \_\_\_\_\_ No X If yes, explain, indicating month(s) of peak production:

\_\_\_\_\_

\_\_\_\_\_

B5. Average number of employees per shift: 1st 100 2nd ~ 10 3rd ~ 5

Shift start times: 1st 7:00 AM 2nd 3:00 PM 3rd 11:00 PM

Shift end times: 1st 3:00 PM 2nd 11:00 PM 3rd 7:00 AM

Shifts normally worked each day:

	<u>Sun.</u>	<u>Mon.</u>	<u>Tue.</u>	<u>Wed.</u>	<u>Thu.</u>	<u>Fri.</u>	<u>Sat.</u>
1st	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
2nd	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
3rd	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>

\* Monthly average stated shall be the highest monthly average production in the previous three years.

### PART C - WATER SOURCE AND USE

**PURPOSE -** The Water Source and Use information will enable BSA to determine the Volumes and Sources of wastewater discharged to the BSA sewer.

#### WATER/WASTEWATER DATA

C1. Water Sources	Average Volume (Gallons per Day)	Peak Flow & Estimated Duration (Gallons per Minute & Time)
Municipal System	<u>N/A</u>	
Recycled		
Private Wells		
Other (Specify) _____		
Water Account No.(s)		

C2. Water Usage	Average Volume (Gallons per Day)	Peak Flow & Estimated Duration (Gallons per Minute & Time)
Cooling Water		
Boiler Makeup		
Process Water	<u>N/A</u>	
Sanitary Purposes		
Other (Specify) _____		

C3. Waste Water Discharge	Average Discharge (Gallons per Day)	Peak Discharge & Estimated Duration (Gallons per Minute & Time)
---------------------------	--	--

Municipal Sewer/Sanitary

<del>- Process *</del> <del>- Sanitary:</del> <del>- Cooling</del>	<u>30,000 GPD</u> <u>60,000 GPD</u>	<u>75 GPM / 8 hr. (ONE Shift)</u> <u>75 GPM / 160 HR (TWO Shifts)</u>
* REGIONAL Dewatering OPERATIONS.		

Non-Sewered Discharges

- Natural Receiving Water	
- Storm Drain	
- Waste Hauler	<u>Modern Hauling</u>
- Evaporation	
- Contained in Product	
- Recycled	
- Other (Specify) _____	

C4. Is your facility permitted to discharge liquid wastes under a State (S.P.D.E.S.) Permit?

Yes X No \_\_\_\_\_ Permit No. NY 0032174

C5. Does your facility have a wastewater discharge from any air pollution control equipment?

Yes \_\_\_\_\_ No X If so what discharge point \_\_\_\_\_

**PART D - SUBSTANCES OF CONCERN  
(REFER TO ATTACHED TABLE I)**

Complete all information for those substances your facility has used, produced, stored, distributed, listed under the TRI report or otherwise disposed of since last application. Do not include chemicals used only in analytical laboratory work. Enter the name and code from Table I. If facility uses a substance in any of the Classes A-M which is not specified in the list, enter it as code class plus 99, e.g. B99 with name, usage, etc.

[illegible]

TABLE 1 - SUBSTANCES OF CONCERN

<u>CLASS A - HALOGENATED HYDROCARBONS AROMATICS</u>	<u>CLASS B - HALOGENATED ORGANICS</u> (other than hydrocarbons)	<u>CLASS C - PESTICIDES</u> (including herbicides, algaecides, biocides, slimicides and mildewcides)	<u>CLASS F - SUBSTITUTE</u> (other than hydrocarbons and non-halogenated)
A01. Methyl chloride A02. Methylene chloride A03. Chloroform A04. Carbon tetrachloride A05. Freon/Genatron A06. Other halomethanes A07. 1, 1, 1-Trichlorethane A08. Other haloethanes A09. Vinyl fluoride A10. Vinyl chloride A11. Dichloroethylene A12. Trichloroethylene A13. Tetrachloroethylene A14. Chlorinated propane A15. Chlorinated propene A16. Hexachlorobutadiene A17. Hexachlorocyclopentadiene A18. Chlorinated benzene A19. Chlorinated toluene A20. Fluorinated toluene A21. Polychlorinated biphenyl (PCB) A22. Chlorinated naphthalene A23. Dechlorane (C <sub>10</sub> C <sub>1</sub> 12) A99. Halogenated hydrocarbons not specified above	B01. Phosgene B02. Methyl Chloromethyl ether B03. bis-chloromethyl ether B04. Other chloroalkyl ethers B05. Benzoyl chloride B06. Chloroethanol B07. Chlorinated phenol B08. Chlorinated cresols or xylenols B09. Chloroacetic acid B10. Chloroalkyl ethers B11. Dichlorophene or hexachlorophene B12. Chlorinated aniline (including methylene bis (2-chloroaniline)) B13. Dichlorobenzidine B14. Chlorinated diphenyl oxide B15. Chlorinated toluidine B16. Kepone B17. Dichlorovinyl sulfonyl pyridine B18. Chloropicrin B20. Trichloro-propylsulfonyl pyridine B21. Tetrachloro-methylsulfonyl pyridine B22. Tetrachloro-isophthalonitrile B99. Halogenated organics not specified above	C01. Aldrin/Dieldrin C02. Chlordane and metabolites C03. DDT and metabolites C04. Endosulfan/Thiodan and metabolites C05. Endrin and metabolites C06. Heptachlor and metabolites C07. Malathion C08. Methoxychlor C09. Parathion C10. Toxaphene C11. Sevin C12. Kelthane C13. Diazinon C15. Carbaryl C16. Silvex C17. Dithiocarbamates C18. Maneb C19. Dioxathion C20. Tandex/Karbutate C21. Carbofurans C22. Pentac C23. Folpet C24. Dichloro C25. Rotenone C26. Lindane/Isotox C27. Simazine C28. Methoprene C99. Pesticides not specified above	F01. Phenol, cresol, or xylol F02. Catechol, resorcinol, or hydroquinone F03. Nitrophenols F04. Nitrobenzenes F05. Nitrotoluenes F06. Aniline F07. Toluidines F08. Nitroanilines F09. Nitroanisole F10. Toluene diisocyanate F11. Dimethylaminocyanobenzene F12. Benzoic Acid (and Benzoate salts) F13. Phthalic, isophthalic or terephthalic acid F14. Phthalic anhydride F15. Phthalate esters F16. Phenoxycetic acid F17. Phenylphenols F18. Nitrobiphenyls F19. Aminobiphenyls (including benzidine) F20. Diphenylhydrazine F21. Naphthylamines F22. Carbazole F23. Acetylaminofluorene F24. Dyes and organic pigments F25. Pyridine F99. Substituted aromatics not specified above
<u>CLASS D - AROMATIC HYDROCARBONS</u> D01. Benzene D02. Toluene D03. Xylene D04. Biphenyl D05. Naphthalene D06. Ethylbenzene D07. Styrene D08. Acenaphthene D09. Fluoranthene D99. Aromatic hydrocarbons not specified above	<u>CLASS G - MISCELLANEOUS</u> G01. Asbestos G02. Acrolein G03. Acrylonitrile G04. Isophorone G05. Nitrosamines G06. Ethyleneimine G07. Propylacetone G08. Nitrosodimethylamine G09. Dimethyl hydrazine G10. Maleic anhydride G11. Methyl isocyanate G12. Epoxides G13. Nitrofurans G14. Cyanide	<u>CLASS M - METALS AND THEIR COMPOUNDS</u> M01. Anthimony M02. Arsenic M03. Beryllium M04. Cadmium M05. Chromium M06. Copper M07. Lead M08. Mercury M09. Nickel M10. Selenium M11. Silver M12. Thallium M13. Zinc M14. Boron M15. Manganese M18. Titanium M21. Tungster M22. Gold M83. Pladium M84. Platinum M99. Metals not specified	
<u>CLASS E - TARS</u> E01. Coal tar E02. Petroleum tar			

If you use chemicals of unknown composition, list trade name or other identification, name of supplier and complete information.

NAME	AVERAGE ANNUAL USAGE	AMOUNT NOW ON HAND	SUPPLIER	PURPOSE OF USE (STATE WHETHER PRODUCED, REACTED, BLENDED, PACKAGED, DISTRIBUTED, NO LONGER USED)

Are you presently permitted to discharge radiological waste by the N.Y.S.D.E.C.? Yes ☐ No ☒

#### PART E - MISCELLANEOUS

- E1. Do you have automatic sampling equipment or continuous wastewater flow metering equipment currently in use or included in future plans?

Current: Flow Metering Yes ☒ No ☐ Sampling Equipment Yes ☐ No ☒  
 Planned: Flow Metering Yes ☐ No ☒ Sampling Equipment Yes ☐ No ☒

- E2. Does your facility pretreat any wastewater prior to discharge to a sanitary sewer? Yes ☐ No ☒

If so, please show locations of pretreatment processes on attached schematic process diagram (Part F) and describe below:

---



---



---

- E3. Do you have a Spill Prevention, Containment and Control Plan (SPCC) and/or Slug Discharge Control Plan for your plant? Yes ☒ No ☐

- E4. Do you have a Solvent Management Plan or a Toxic Organic Management Plan? Yes ☐ No ☒

- E5. Do you generate any liquid or solid waste such as solvents, electroplating sludges, thinners, oils, still bottoms, fly ash, filler, etc? Yes ☐ No ☒. If yes, please fill out the following table:



TYPE OF WASTE	IF THIS WASTE IS PRODUCED BY PRETREATMENT CHECK HERE	AMOUNT PER YEAR (SPECIFY LBS, TONS OR GALS)	METHOD OF DISPOSAL CHECK EACH METHOD USED				
			ON-SITE	SANITARY LANDFILL	HAZARDOUS WASTE FACILITY	RECLAIMED OR RESUED	OTHER
Water treatment plant residuals		2,400 wet tons		X			

E6. Description of Disposal Method:

a. Disposal Site

Modern Hauling. Niagara Falls, NY

b. Hazardous Waste Hauler - Please give name and address N/A

c. Reclaimed or Reused - Please describe process, if on-site, or give name and address of reclaimer

N/A

d. Other - Please describe N/A

E7. Do you store any hazardous wastes on-site? Yes ☐ No ☒

E8. Have you filed an EPA Form 8700-12 (Notification of Hazardous Waste Activity)? Yes ☐ No ☒  
If yes, please attach.

E9. What is your Hazardous Waste Number? N/A

E10. Do you discharge into the Buffalo Sewer Authority a waste identified by 40 CFR 261 as hazardous waste?  
Yes ☐ No ☒

E11. If your facility is discharging a hazardous waste, have you properly notified the Buffalo Sewer Authority?  
Yes ☐ No ☒

## **PART F - SCHEMATIC FLOW DIAGRAM**

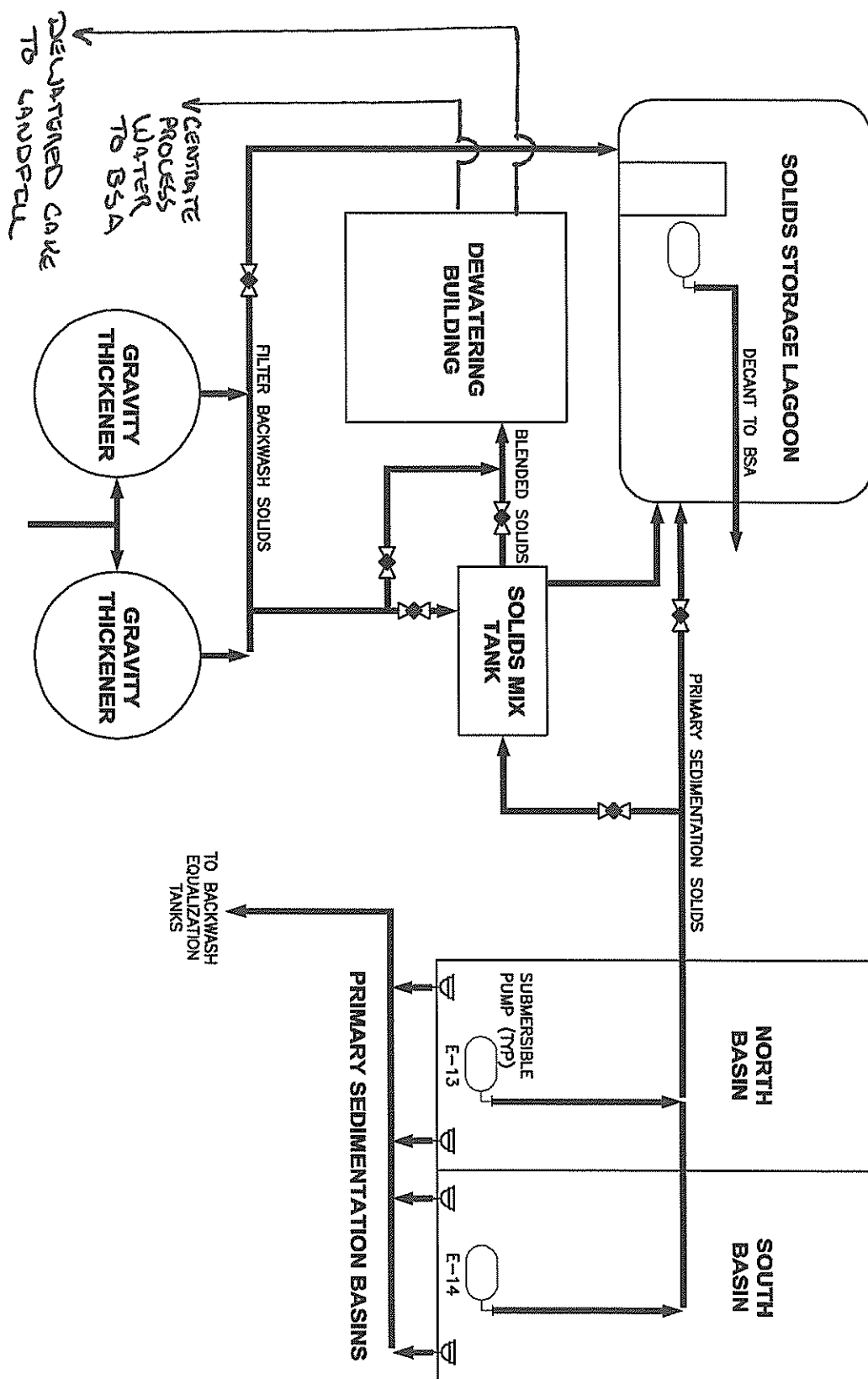
**PURPOSE** - The Schematic Flow Diagram shows the flow pattern of products through the facility and the various sources of wastewater.

**F1.** Schematic Flow Diagram - For each major activity in which wastewater is generated, draw a diagram of the flow of materials and water from start to completed project, showing all unit processes generating wastewater. Number each unit process having wastewater discharges to the community sewer.

**F2.** General Instructions - Type or print the information. A line drawing (schematic flow diagram) of each major business activity described in Part B is to be drawn in on an attached sheet of paper (all sheets should be letter size). An example of drawing required is shown in Figure 1. To determine your average daily volume and maximum daily volume of wastewater flow you may have to read water meters, sewer meters, or make estimates of volumes that are not directly measurable.

FILE:L\WPDOCS\APPLICATIONS\BPDES PERMIT APPLICATION.DOC

REVISED 3/19/93, 8/30/94, 12/1/94, 10/7/96, 10/25/98, 5/1/05



CITY OF BUFFALO BUFFALO, NY COLONEL WARD PUMPING STATION VEOLIA WATER NORTH AMERICA		NO.	REVISIONS	APP'D
PROJ NO: 12732C		DATE: AUGUST 2013		
WRIGHT-PIERCE Engineering a Better Environment		SOLIDS HANDLING PROCESS FLOW		FIGURE: 1

# Tier 2 Online Submission Report

## E-Plan - University of Texas at Dallas

### Reporting period : From January 1, 2017 to December 31, 2017

<b>Facility Name</b>	City of Buffalo Water Facility	<b>Facility ID</b>	6084812
<b>Company Name</b>	Buffalo Water Authority	<b>Facility Email</b>	jjford@city-buffalo.com
<b>Department Name</b>		<b>Mail Address</b>	2 Porter Ave , Buffalo , NY - 14201
<b>Physical Address</b>	2 Porter Ave , Buffalo, Erie county , NY - 14201 , USA		
<b>Max. No. of Occupants</b>	120	<b>Latitude / Longitude</b>	42.561111 / -78.9
	<input checked="" type="checkbox"/> Manned <input type="checkbox"/> Unmanned	<b>Facility Phone Number</b>	716-851-4747 ext 135
<b>NAICS</b>	221310 - Water Supply and Irrigation Systems	<b>Dun &amp; Bradstreet</b>	N/A -
<b>TRI Facility ID</b>		<b>RMP Facility ID</b>	
<b>Subject to Emergency Planning under Section 302 of EPCRA (40 CFR part 355)?</b>			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Subject to Chemical Accident Prevention under Section 112(r) of CAA (40 CFR part 68, Risk Management Program)?</b>			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Facility Note</b>			

Contact Information	Name (Title)	Phone	Email	Mail address
Emergency Contact	Hill David (Operations Manager)	270-570-3040 (24-hour) 716-847-1065 214 (Work)	david.hill3@veolia.com	2 Porter Avenue, Buffalo, Erie COUNTY, NY - 14201, United States
Emergency Contact	Patrick Martin (Pumping Plant Superintendant)	716-851-4747 ext 121 (Work) 716-983-4155 (24-hour)	pmartin@city-buffalo.com	2 Porter Ave, Buffalo, Erie COUNTY, NY - 14201, USA
Fac. Emergency Coordinator	Hill David (Operations Manager)	270-570-3040 (24-hour) 716-847-1065 214 (Work)	david.hill3@veolia.com	2 Porter Avenue, Buffalo, Erie COUNTY, NY - 14201, United States
Facility Phone	City of Buffalo Water Facility	716-851-4747 ext 135 (FP)		, , , - ,
Owner / Operator	Steven Stepniak (Commissioner of Public Works)	7168515636 (24-hour) 7168515636 (Work)	sstepniak@ch.ci.buffalo.ny.us	65 Niagara Square - City Hall, Room 502, Buffalo, Erie COUNTY, NY - 14202, United States
Owner / Operator	Peter Merlo (Engineer)	716-359-7677 (24-hour) 716-851-9626 (Work)	pmerlo@city-buffalo.com	65 Niagara Square, Buffalo, Erie COUNTY, NY - 14202, USA
Owner / Operator	Peter Merlo (Engineer)	716-359-7677 (24-hour) 716-851-9626 (Work)	pmerlo@city-buffalo.com	65 Niagara Square , Buffalo , Erie , NY - 14202 , USA
Tier II Information Contact	Jan Robin Ford (Water Treatment Supervisor)	716-541-7938 (Mobile - Cell) 716-851-4747 ext 130 (Work) 716-541-7938 (24-hour)	jjford@city-buffalo.com	2 Porter Avenue, Buffalo, Erie COUNTY, NY - 14201, USA

### Chemical Inventory Information

**Tier 2 Online Submission Report**  
**E-Plan - University of Texas at Dallas**  
**Reporting period : From January 1, 2017 to December 31, 2017**

Chemical Description	Physical Hazards	Health Hazards	Inventory	Mixture components	Storage locations and codes (Non- Confidential)
CAS <u>7782505</u> Trade Secret [ ] Chem. Name <u>Chlorine</u> Pure [X] Mixture [ ] Solid [ ] Liquid [X] Gas [X] EHS [X] Below Reporting Thresholds [ ]  <b>State Specific Information</b> No State specific information	Explosive [ ] Flammable (gases, aerosols, liquids, or solids) [ ] Oxidizer (liquid, solid or gas) [X] Self-reactive [ ] Pyrophoric (liquid or solid) [ ] Pyrophoric Gas [ ] Self-heating [ ] Organic peroxide [ ] Corrosive to metal [X] Gas under pressure (compressed gas) [X] In contact with water emits flammable gas [ ] Combustible Dust [ ] Hazard Not Otherwise Classified [ ]	Acute toxicity (any route of exposure) [ ] Skin corrosion or irritation [X] Serious eye damage or eye irritation [X] Respiratory or skin sensitization [X] Germ cell mutagenicity [ ] Carcinogenicity [ ] Reproductive toxicity [ ] Specific target organ toxicity (single or repeated exposure) [ ] Aspiration hazard [ ] Simple Asphyxiant [ ] Hazard Not Otherwise Classified [ ]	<u>49,999</u> Max. Daily Amount <u>49,999</u> Avg. Daily Amount <u>2,000</u> Max. Amount in largest Container <u>365</u> No. of Days On-site	Chemical Name-Chlorine (CAS 7782505) Percentage-100.0 Unit-Vol Max Amount Code-07	<b>1)</b> 2 Porter Ave. Along side of low lift pump room building: Type <u>Tank inside building</u> , Pressure <u>Ambient pressure</u> , Temperature <u>Ambient temperature</u>  <b>2)</b> 2 Porter Ave. Along Side of low lift pump room building: Type <u>Tank inside building</u> , Pressure <u>Ambient pressure</u> , Temperature <u>Ambient temperature</u>
CAS <u>7631905</u> Trade Secret [ ] Chem. Name <u>Sodium Bisulfite, [liquid]</u> Pure [ ] Mixture [X] Solid [ ] Liquid [X] Gas [ ] EHS [ ] Below Reporting Thresholds [ ]  <b>State Specific Information</b> No State specific information	Explosive [ ] Flammable (gases, aerosols, liquids, or solids) [ ] Oxidizer (liquid, solid or gas) [X] Self-reactive [ ] Pyrophoric (liquid or solid) [ ] Pyrophoric Gas [ ] Self-heating [ ] Organic peroxide [ ] Corrosive to metal [X] Gas under pressure (compressed gas) [X]	Acute toxicity (any route of exposure) [X] Skin corrosion or irritation [X] Serious eye damage or eye irritation [X] Respiratory or skin sensitization [X] Germ cell mutagenicity [ ] Carcinogenicity [ ] Reproductive toxicity [ ] Specific target organ toxicity (single or repeated exposure) [ ]	<u>24,999</u> Max. Daily Amount <u>24,999</u> Avg. Daily Amount <u>377</u> Max. Amount in largest Container <u>365</u> No. of Days On-site		<b>1)</b> 2 Porter Avenue, Buffalo NY Chlorine Building: Type <u>Above ground tank</u> , Pressure <u>Greater than ambient pressure</u> , Temperature <u>Ambient temperature</u>  <b>2)</b> 2 Porter Ave. Along Side of low lift pump room building: Type <u>Carboy</u> , Pressure <u>Ambient pressure</u> , Temperature <u>Ambient temperature</u>

**Tier 2 Online Submission Report**  
**E-Plan - University of Texas at Dallas**  
**Reporting period : From January 1, 2017 to December 31, 2017**

Chemical Description	Physical Hazards	Health Hazards	Inventory	Mixture components	Storage locations and codes (Non- Confidential)
	In contact with water emits flammable gas [ ] Combustible Dust [ ] Hazard Not Otherwise Classified [ ]	Aspiration hazard [ ] Simple Asphyxiant [ ] Hazard Not Otherwise Classified [ ]			

### State Specific Information

No State specific information

### Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages \_\_ through \_\_ , and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate and complete.

**Jan Robin Ford**

\_\_\_\_\_  
 Name and official title of owner/operator OR owner/operator's authorized representative

\_\_\_\_\_  
 Signature

**2018-02-20**

\_\_\_\_\_  
 Date signed

Month/Year		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
<b>Monthly Precipitation (inches)</b>		4.65	3.15	3.17	5.01	5.09	2.93	3.73	3.61	2.93	3.99	2.72	2.82
Gal per Month	Ward Station pavement	463,760	314,160	316,155	499,664	507,643	292,219	372,005	360,037	292,219	397,936	271,275	281,248
	Ward Roof Area	434,775	294,525	296,395	468,435	475,915	273,955	348,755	337,535	273,955	373,065	254,320	263,670
	Ward Station total	898,535	608,685	612,550	968,099	983,558	566,174	720,760	697,572	566,174	771,001	525,595	544,918
	Filter Plant total	608,685	412,335	414,953	655,809	666,281	383,537	488,257	472,549	383,537	522,291	356,048	369,138
Gal per Day	Ward Station pavement	14,960	10,134	10,538	16,118	16,921	9,426	12,000	12,858	9,426	13,265	8,751	9,375
	Ward Roof Area	14,025	9,501	9,880	15,111	15,864	8,837	11,250	12,055	8,837	12,436	8,204	8,789
	Ward Station total	28,985	19,635	20,418	31,229	32,785	18,264	23,250	24,913	18,264	25,700	16,955	18,164
	Filter Plant total	19,635	13,301	13,832	21,155	22,209	12,372	15,750	16,877	12,372	17,410	11,485	12,305
<b>Pumpage Totals</b>													
Gal per Month	Screen House	24,800	37,200	36,000	12,400	12,000	12,400	11,200	11,200	22,400	16,800	22,400	33,600
	East LLPR	33,600	33,600	33,600	33,600	33,600	24,000	12,000	12,000	7,200	12,000	7,200	7,200
	West LLPR #1	3,264,300	3,264,300	3,159,000	3,264,300	3,159,000	3,264,300	3,264,300	2,948,400	3,264,300	3,159,000	3,264,300	3,159,000
	West LLPR #2	2,929,500	2,929,500	2,835,000	2,929,500	2,835,000	2,929,500	2,929,500	2,646,000	2,929,500	2,835,000	2,929,500	2,835,000
	HH Deep Well Pit	3,543	3,543	3,429	3,543	5,143	3,543	5,314	4,800	3,543	5,143	3,543	3,429
	HH Backwash Pit	5,314	5,314	5,143	2,657	3,857	2,657	2,657	2,400	2,657	3,857	2,657	2,571
	Thickeners	664	664	321	332	161	166	498	450	996	482	996	804
	Round House	27,900	27,900	27,000	27,900	40,500	27,900	69,750	63,000	27,900	67,500	27,900	40,500
Gal per Day	Screen House	800	1,200	1,200	400	400	400	361	400	723	560	723	1,120
	East LLPR	1,084	1,084	1,120	1,084	1,120	774	387	429	232	400	232	240
	West LLPR #1	105,300	105,300	105,300	105,300	105,300	105,300	105,300	105,300	105,300	105,300	105,300	105,300
	West LLPR #2	94,500	94,500	94,500	94,500	94,500	94,500	94,500	94,500	94,500	94,500	94,500	94,500
	HH Deep Well Pit	114	114	114	114	171	114	171	171	114	171	114	114
	HH Backwash Pit	171	171	171	86	129	86	86	86	86	129	86	86
	Thickeners	21	21	11	11	5	5	16	16	32	16	32	27
	Round House	900	900	900	900	1,350	900	2,250	2,250	900	2,250	900	1,350
<b>Outfalls</b>													
Gal per Month	001 & 004	36,757	36,757	35,571	34,100	49,500	34,100	77,721	70,200	34,100	76,500	34,100	46,500
	002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	003A	ND	ND	ND	21,000,000	23,400,000	13,000,000	ND	22,300,000	40,200,000	37,900,000	10,800,000	38,000,000
	005	6,836,749	6,640,399	6,442,874	6,883,541	6,694,042	6,601,503	6,694,555	6,079,399	6,585,533	6,528,773	6,558,044	6,371,142
	006	24,800	37,200	36,000	12,400	12,000	12,400	11,200	11,200	22,400	16,800	22,400	33,600
	007	898,535	608,685	612,550	968,099	983,558	566,174	720,760	697,572	566,174	771,001	525,595	544,918
	009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gal per Day	001 & 004	1,186	1,186	1,186	1,100	1,650	1,100	2,507	2,507	1,100	2,550	1,100	1,550
	002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	003A	ND	ND	ND	1,312,500	1,114,286	1,300,000	ND	1,311,765	1,296,774	1,353,571	372,414	1,357,143
	005	220,540	214,206	214,762	222,050	223,135	212,952	215,953	217,121	212,437	217,626	211,550	212,371
	006	800	1,200	1,200	400	400	400	361	400	723	560	723	1,120
	007	28,985	19,635	20,418	31,229	32,785	18,264	23,250	24,913	18,264	25,700	16,955	18,164
	009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = No discharge during reporting period



## Water Withdrawal Reporting Form

Due by March 31<sup>st</sup> each year

Section 1 of 6 - Basic Information

Prior to filling out this form, please read the instructions on the last page

*This form not for Agricultural Facilities*

Facility Name  Facility Street Address  Reporting Year

City  Zip  Town  County

Contact Name  Email  Telephone

Source Name	Source Type	Well Depth	Max Rate	Units	MGD
<input type="text" value="Lake Erie"/>	<input type="text" value="L"/>	<input type="text"/>	<input type="text" value="160"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Average Day Withdrawal  MGD  Maximum Day Withdrawal  MGD  Units

Submitted by  Title  Date

### Water Withdrawal Category

(Check One)

☒ Agricultural - Must use form at <http://www.dec.ny.gov/lands/86904.html>

☐ Bottled / Bulk Water

☐ Commercial

☐ Environmental

☐ Industrial

☐ Institutional

☐ Mine Dewatering

☐ Oil / Gas Production

☐ Power Production:

☐ Fossil Fuel

☐ Nuclear

☐ Other Pwr

☒ Public Water Supply

Recreational:

☐ Golf Course

☐ Snow Making

☐ Other Rec

☐ Other Category

emailed on 5-1-18 to AWQRDEC@dec.ny.gov



# Water Withdrawal Reporting Form Section 2 of 6 - Water Use

Calculation Method ☒ M

If multiple methods are used, choose the one that measures the greatest percentage of water in your system.

E = Estimated

M = Metered readings

W = Flow through a weir

P = Flow through a pipe or pump run times

C = Pump curve calculation

Units: Must be in gallons per month	January	February	March	April	May	June
Withdrawn	2,213,245,833	2,008,570,830	2,172,287,500	2,055,670,000	2,076,730,000	2,048,670,000
Transferred / Imported / Purchased	-140,000	-195,000	-555,000	-630,000	-435,000	-150,000
Consumed	2,096,945,000	1,968,905,310	2,132,534,000	2,002,170,000	2,035,210,000	1,980,800,000
Returned	7,196,937	6,370,291	7,666,591	8,126,917	8,333,924	6,786,835
Diversions In / Out, if any						

For Transferred water or Diversions Out, use a negative (-) sign

Units: Must be in gallons per month	July	August	September	October	November	December
Withdrawn	215,274,000	2,209,370,000	2,014,230,000	2,029,370,000	1,979,650,000	2,118,780,000
Transferred / Imported / Purchased	-155,000	-80,000	-5,300,000	-2,020,000	-430,000	-265,000
Consumed	2,026,690,000	2,194,150,000	1,979,750,000	2,028,160,000	1,814,200,000	1,904,420,000
Returned	7,796,841	7,323,041	7,156,996	9,211,043	9,065,766	7,214,177
Diversions In / Out, if any						

Describe location of returned water

Lake Erie south of Peace Bridge



**Water Withdrawal Reporting Form**  
**Section 3 of 6 - General Map and Interbasin Diversions**

**General Map Required**

Please submit a map showing the location of all withdrawals and any points of return flow. Precise locations will remain confidential.

**A map is not necessary if one was submitted in a previous year and no changes have occurred.**

A paper copy of a USGS map or other high quality map or an electronically generated map can be faxed, mailed, or emailed. Please ensure that the map scale is sufficient to be able to see specific locations. Designate all water withdrawal locations on the map. Add markers to locate any related dams, weirs, or diversion structures. Label the name of each point.

Submit your map to DEC in one of the following ways:

- Print and mail or fax to 518 402-8290. Include cover letter identifying facility owner.
- Print, scan and email to [awqrsdec@dec.ny.gov](mailto:awqrsdec@dec.ny.gov)
- Copy electronically and email to [awqrsdec@dec.ny.gov](mailto:awqrsdec@dec.ny.gov)

**Interbasin Diversions**

Fill out this section only if water is being transferred between major drainage basins. To determine basin ID, go to the DEC Major Drainage Basins map (<http://www.dec.ny.gov/lands/56800.html>). Then enter the basin ID by using the drop down menus under Originating and Receiving Major Drainage Basin headings below. Describe the locations of originating and receiving sites in the site description boxes (e.g. Town water intake on Route 12 at northern end of Pleasant Lake to Stony Reservoir near Bear Road).

Originating Major Drainage Basin

Basin Name

Originating Site Description

Receiving Major Drainage Basin

Basin Name

Receiving Site Description

## **Water Withdrawal Reporting Form**

### **Section 4 of 6 - Water Conservation and Efficiencies**

**Instructions:** Check one of the boxes below for EITHER Section A or Section B, as appropriate for your facility type. A list of questions pertinent to that facility type will appear. Please answer all questions.

☒ Section 4A: Public Water Supply Facilities

☐ Section 4B: Non-Public Water Supply Facilities

If the incorrect box is selected, just scroll back up a page and change selection

**NOTE:** All permitted water withdrawal systems must have a Water Conservation Program.



## Water Withdrawal Reporting Form

### Section 4A: Public Water Supply Facilities

Public water suppliers must answer all the questions in this section

1. Are all sources of supply including major interconnections equipped with master meters? ☒ Yes ☐ No
2. What percentage of your system is metered?  % Average age of meters, in years:  Range of age of meters, in years:
3. How often were customer meters read this past year? (choose from drop list)
4. Number of water service connections:  Total population served:
5. How many customer meters were recalibrated and/or replaced in the past year?
6. Miles of pipe in water distribution system:  Length of pipe replaced in the past year:  Units
7. Miles of pipe on which leak detection was performed using sonic listening equipment:  Type of equipment used:
8. How many system-wide water audits were performed in the past year?
9. Residential charge per 1000 gallons of water: \$
10. What percentage of the water withdrawn was not billed to customers?  % Lost to distribution system leakage?  %
11. Was information about household water saving devices and ways to reduce water use distributed to residential customers? ☒ Yes ☐ No
12. Was water conservation information about promoting recycling and reuse distributed to industrial and commercial customers? ☒ Yes ☐ No
13. Do you have lawn sprinkling time restrictions (e.g. odd/even days) during periods of peak demand? ☐ Yes ☒ No
14. Do you have a plan that takes progressive steps to further reduce outdoor water use ☐ Yes ☒ No If yes, please forward a copy to the address during drought conditions with an ordinance or procedure to assure compliance? shown in Section 1 of this form.
15. Please review your permit(s) for any specific water conservation conditions and report below on progress made in past year:

We increase the amount of hours on our 40 rapid sand filters. Each time a filter is washed, 100,000 gallons of water is used. When possible we have our filters backwash at 96 hour intervals instead of 72 hours.

## Water Withdrawal Reporting Form

### Section 5 of 6 - Outside Sales to Other Water Systems or Facilities

#### Instructions:

Permittees must record any sales to outside water systems or facilities. If this applies to your facility, please check the box titled, "Section 5 - Outside Sales" and fill in the information requested.

If your facility does not sell water to systems or facilities other than your own, skip the section by clicking the box for "No Outside Sales".

☒ Section 5 - Outside Sales

☐ No Outside Sales

If the incorrect box is selected, just scroll back up a page and change selection



## Water Withdrawal Reporting Form

### Section 5 - Outside Sales to Other Water Systems or Facilities

Permittees must record any sales occurring outside of their water service area or facility and include the information requested below. If this does not apply to your facility, please proceed to the next section.

[illegible]

Facility Type: PWS=public water supply; IND=Industrial; COM=Commercial; INS=Institutional; O/G=oil or gas; REC=Recreational; BOT=Bottled or bulk

Type of Sale: C=Continuous; I=Intermittent; E=Emergency

To calculate Average Amount, divide total water (gallons) used in year by number of days of purchase. Total is in gallons per day.

Maximum Amount is the one day greatest use in the year of record, shown in gallons per day



## **Water Withdrawal Reporting Form**

### **Section 6 of 6 - Forward Form To NYSDEC**

Unless required fields have not been filled in, the form can now be sent to NYSDEC. To send the form electronically, simply click the green box titled, "Click here to submit by email after filling out all sections of this form". Alternatively, the form can be printed and then mailed or faxed to NYSDEC at the address found on the first page.

When the form is sent by clicking the "submit by email" button, an automatic confirmation is returned. If this does not arrive within 10 minutes, please contact [awqrsdec@dec.ny.gov](mailto:awqrsdec@dec.ny.gov)

**Click here to submit by email  
after filling out all sections  
of this form**

**Print Form**

**Print Blank Form For  
Handwritten Submission**

**Clear Entire  
Form**



## Water Withdrawal Reporting Form

### Instructions & Definitions

Agricultural Purpose	The practice of farming for crops, plants, vines and trees, and the keeping, grazing or feeding of livestock, for sale of livestock or livestock products. Agricultural facilities must use the form titled "Registration and Water Withdrawal Reporting Form for Agricultural Facilities".
Public Water Supply	Supply water to the public. Examples include: municipality, hotel, apartment, restaurant, church, campground, etc.
Source Name	Name of well or surface water body (e.g., Well No. 1, Alcove Reservoir, etc.). List all sources including unused or back-up wells.
Source Type	S = Stream or River. L = Pond or Lake. R = Reservoir. BW = Bedrock Well. UW = Unconsolidated Well (e.g., sand and gravel). SP = Spring. P = Purchased.
Well Depth	Total depth in feet below ground surface. Leave blank for surface sources.
Max Rate	Maximum potential withdrawal rate of the water source. Will be equal to or greater than Permitted Rate.
Units (Max Rate)	Gallons per minute (gpm), gallons per day (gpd), or million gallons per day (mgd). Use drop down menu.
Average Day Withdrawal	Total amount withdrawn during reporting year divided by total days withdrawn.
Maximum Day Withdrawal	Largest single day withdrawal rate of the source during the reporting year.
Maximum Sys Capacity or Permitted Withdrawal	If permit information is unknown, contact NYSDEC at <a href="mailto:awqrsdec@dec.ny.gov">awqrsdec@dec.ny.gov</a> or 518-402-8182. Maximum system capacity is the sum of all sources simultaneously pumping at full rate.
Calculation Method	If multiple methods are used, choose the one that measures the greatest percentage of water in your system E = estimated. M = metered readings. W = flow through a weir or flume. P = flow through a pump or pump run time. C = Pump curve calculation.
Withdrawn	Amount of water removed from all sources. This includes groundwater and/or surface water.
Transferred/Imported	Amount of water brought in from or sent to another facility, includes bulk sales. For transferred water use a negative (-) sign.
Consumed	Amount of water not returned (e.g. water incorporated into a product or lost through evaporation). Public water suppliers must use metered sales to customers. Irrigation is considered "consumed water".
Returned	Amount of water discharged to a water treatment system or discharged back to the environment. Irrigation is not returned water.
Diversions In/Out	Amount of water, if any, diverted from/to another major drainage basin. For Diversions Out, use a negative (-) sign.
Location of Returned Water	State the general area where returned water is discharged. Example: "Hudson River near Poughkeepsie", "Groundwater near Auburn".
Major Drainage Basins	Report only "Major Basin" transfers. Use the internet link available on the form and enter Basin ID into the box indicated (use drop down menu). Describe the location of originating withdrawal and receiving discharge. Be as specific as possible.
Water Audit	A water audit is a thorough examination of the accuracy of water records and system control equipment to determine water system efficiency and to identify, quantify, and verify water and revenue losses. Water audits are beneficial in identifying the amount of unaccounted-for water.

# Automatic reply: Water Withdrawal Report from Buffalo Water

dec.sm.AWQRSDEC <AWQRSDEC@dec.ny.gov>

Tue 5/1/2018 3:53 PM

To: Ford, JanRobin J. <jjford@ch.ci.buffalo.ny.us>;

Your e-mail has been received. Thank you





# 2017 Annual Drinking Water Quality Report



Consumer Confidence Report  
Buffalo, New York

# Introduction

To comply with State regulations, Buffalo Water (managed by Veolia NA) will be annually issuing a report describing the quality of your drinking water. The purpose of this report is to raise your understanding of drinking water and awareness of the need to protect our drinking water sources.

## **Last year, your tap water met all State drinking water health standards.**

This report is an overview of last year's water quality. Included are details about where your water comes from, what it contains, and how it compares to State standards. We are pleased to provide you with this information because informed customers are our best customers.

If you have any questions about this report or concerning your drinking water, please contact Jan Robin Ford, Water Treatment Supervisor at (716) 847-1065 ext. 130. We want you to be informed about your drinking water. If you would like to learn more, please attend any of the regularly scheduled Water Board meetings, typically held the second Wednesday of each month at 8:00 AM, Room 502 – City Hall.



**Buffalo Water**  
**Managed by Veolia NA, LLC**  
2 Porter Avenue  
Buffalo, NY 14201  
PWS ID# NY1400422

**MAYOR BYRON W. BROWN**

**Buffalo Water Board:**

Chairperson: Oluwole McFoy, P.E.

Commissioner of Public Works:  
Steven J. Stepniak

**Members:**

Michael Finn, P.E.  
Gerald E. Kelly  
William Sunderlin

**Veolia Water Managers:**

Project Manager: David Hill

Operations Manager:  
Douglas Fultz, P.E.

**Billing & Customer Service**

281 Exchange Street  
Buffalo, NY 14204

**Water Treatment Plant**

2 Porter Avenue  
Buffalo, NY 14201

**Useful Phone Numbers**

Customer Service & Emergency:

**(716) 847-1065**

Water Quality Inquiries:

**(716) 847-1065, ext. 133**

**Website:**

[www.buffalowater.org](http://www.buffalowater.org)

## Where does our water come from?

### LAKE ERIE FACTS

- **Lake Erie is the 11th largest world lake (4th largest Great Lake by surface area)**
- **Length: 241 miles; Width 57 miles**
- **Average Depth: 62 feet**
- **Max Depth: 210 feet; Vol: 116 miles<sup>3</sup>**
- **Elevation: 569 feet; Shoreline: 871 miles**
- **Surface Area: 9,910 miles<sup>2</sup>**
- **Drainage Basin Area: 30,140 miles<sup>2</sup>**
- **Outlet: Niagara River & Welland Canal**

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activities. Contaminants that may be present in source water include: microbial contaminants; inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and radioactive contaminants. In order to ensure that tap water is safe to drink, the State and the Federal Environmental Protection Agency (EPA) prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. The State Health Department and the Federal Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

### **Our water source is Lake Erie**

(a surface water source) which is the southernmost of the Great Lakes, bounded on the north by the Canadian province of Ontario, on the south by the U.S. states of Ohio, Pennsylvania, and New York, and on the west by the state of Michigan. Lake Erie is the shallowest of the Great Lakes, with an average depth of only 62-ft. It also has the shortest detention time of the Great Lakes. Water remains in the lake for only 2.6 years before it is replaced by fresh water (as compared with 191 years in Lake Superior or 22.6 years in Lake Huron). It is also the siltiest of the Great Lakes. Its bottom consists of fine sand, easily upset during turbulent storms. The combination of its shallowness, short detention time and sandy unstable bottom is especially beneficial to our water quality. The lake is able to flush itself of harmful contaminants such as pesticides and other organic wastes. When Lake Erie becomes turbulent, fine particles of sand and silt become agitated and suspended throughout the lake. Organic contaminants have the propensity to cling to these particles and be flushed from the lake. Therefore, water treatment begins as a natural process due to the structure and makeup of Lake Erie. During 2017, our system did not experience any restriction of our water source.

**For health issues, contact:**

Erie County Health Dept:  
**(716) 961-6800**

**Senior Citizen's Discount,**

**contact:** Dept of Assessments at  
**(716) 851-5733**

*Este informe contiene  
información muy importante  
sobre su agua beber.  
Tradúzcalo ó hable con  
alguien que lo entienda bien.*





## Customer cost

The average 2016 annual water charge was approximately \$415.00 per year. The total quarterly bill includes the cost of water used and the service charge. Eligible senior citizens receive a discount.

Water Usage (gallons)		Price per 1000 gallons		Quarterly Service Charge as of July 1, 2012			
Monthly	Quarterly	Regular	Seniors	Meter Size	Regular	Seniors	Meter Size
Up to 29,913	Up to 74,793	\$3.05	\$1.84	5/8"	\$34.90	\$17.17	3"
29,920 - 97,240	74,800 - 269,280	\$2.86	\$1.71	3/4"	\$49.22	\$25.86	4"
				1"	\$87.30	\$42.96	5"
over 97,240	over 269,280	\$2.18	\$0.64	1 1/2"	\$174.61	\$86.02	8"
				2"	\$279.19	\$137.42	10"

## Abbreviations and Definitions of Terms used in this report:

**MCLG** (Maximum Contaminant Level Goal): The level of contaminant in drinking water below which there is no known or expected risk to health, MCLGs allows for a margin of safety.

**MCL** (Maximum Contaminant Level): The highest level of contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible.

**MRDL** (Maximum Residual Disinfectant Level): The highest level of a disinfectant (chlorine) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG** (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant (chlorine) below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

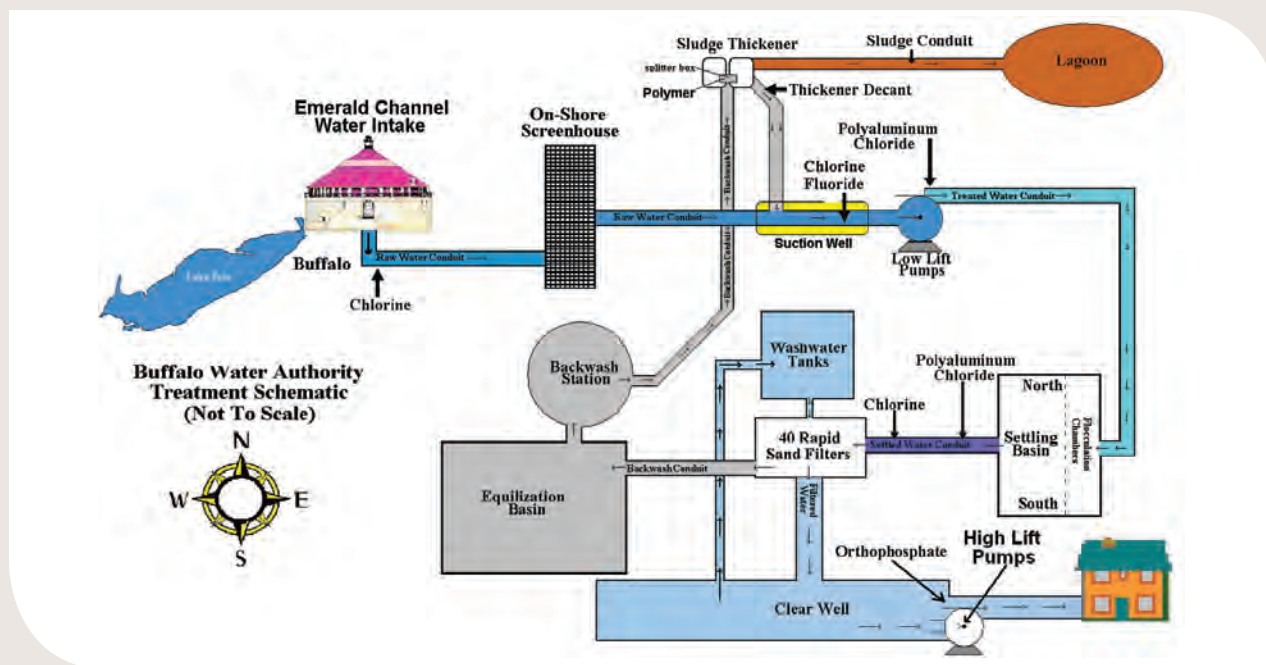
**TT** (Treatment Technique): A required process intended to reduce the level of contamination in drinking water.

**AL** (Action Level): The concentration of a contaminant, which, if exceeded, triggers a treatment, or other requirement, which a water system must follow.

**NTU** (Nephelometric Turbidity Units): A measure of clarity (turbidity) of water, turbidity in excess of 5 NTU is just noticeable to the average person.

**Poly/Ortho – phosphate**: A chemical blend used as a treatment technique (TT) intended to minimize the potential for lead and copper contamination in drinking water. EPA's Action Level (AL) for lead in water delivered to users of public drinking water systems is 15 µg/L. (parts per billion) Its goal for lead is zero.

**Floc**: Clumps or tufts formed when suspended particles combine with chemical substance or compound that promotes the combination, agglomeration, aggregation or coagulation of suspended particles in the water.



**Sedimentation**: The process of suspended solid particles settling out (going to the bottom of the vessel) in water.

**Coagulation**: Agglomeration of finely divided particles into larger particles, which can then be removed by settling and/or filtration.

**ppm**: Parts per million, or milligrams per liter (mg/L). Corresponds to one part of liquid in one million parts of liquid.

**ppb**: Parts per billion, or micrograms per liter (µg/L). Corresponds to one part of liquid in one billion parts of liquid.

**ND**: Not detected.

**N/A**: Not applicable.

**TTHM** (Total Trihalomethane): Organic compounds, which are disinfection by-products of the chlorination of drinking water. Some people who drink water with TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

**HAA** (Halogenated Acetic Acids): Organic compounds, which are disinfection by-products of the chlorination of drinking water, currently the EPA lists HAAs as a health advisory.

**TOC** (Total Organic Carbon); **SUVA** (Specific Ultraviolet Absorption): A measure of the organic content of the water. This is a precursor to disinfection by-product when combined with the chlorination of drinking water.

**90th % Value**: The values reported for lead & copper represent the 90th percentile for each of these contaminants. A percentile is a value

on a scale of 100 that indicates a percent of a distribution that is equal to or below it. The 90th percentile is equal to or greater than 90% of the lead (or copper) values detected at your water system.

**RAA**: The value in the Running Annual Average (RAA) field is the average of the Monitoring Period Average (MPA) for a year. It is calculated by determining the monitoring periods that began within 365 for the current monitoring period and averaging them.

## Stage 2 Disinfection Byproducts (2017)

Sample Site	THM Avg. (range), ppb	HAA Avg. (range), ppb
1625 Bailey Ave	26.7 (20.7-40.7)	14.8 (11.7-16.5)
3043 Main St	30.5 (23.2-50.1)	14.8 (13-15.9)
1110 Abbott Rd	30.6 (19.5-43.7)	17.5 (13.3-20.7)
150 Reading St	37.3 (30.1-53.5)	13.1 (11.2-17.2)
396 Kenmore Ave	30.5 (22.5-43)	13.5 (10.7-16.5)
262 Grider St	28.6 (20.8-37.6)	15.4 (11.9-18.3)
398 Dingens St	32.1 (24.5-46.1)	14.4 (13.2-14.9)
3396 Bailey Ave	29.5 (20.5-46.1)	14.6 (9.4-17.3)
300 Dorrance Ave	31.2 (18.6-52.3)	17.2 (13.2-19.4)
24 Westminster Ave	31.2 (22.5-43.9)	15 (13-16.5)
2 Templeton Terr.	33.3 (25-48)	17.8 (13.1-20.9)
939 Abbott Rd	33.7 (25-46.8)	18.2 (16-19.6)



## Source water assessment (SUMMARY)

A source water assessment was completed under the New York State Department of Health (NYSDOH) Source Water Assessment Program (SWAP). The following is the Executive Summary of this report:

“The New York State Department of Health recently completed a draft Source Water Assessment of the raw water supply’s source under the state’s Source Water Assessment Program (SWAP). The purpose of this program is to compile, organize, and evaluate information regarding possible and actual threats to the quality of public water supply (PWS) sources. It is important to note that source water assessment reports estimate the potential for untreated drinking water sources to be impacted by contamination. These reports do not address the safety or quality of treated finished potable tap water.

The Great Lakes’ watershed is exceptionally large and too big for a detailed evaluation in the SWAP. General drinking water concerns for public water supplies which use these sources include: storm generated turbidity, wastewater, toxic sediments, shipping related spills, and problems associated with exotic species (e.g. zebra mussels – intake clogging and taste and odor problems). The SWAP is based on the analysis of the contaminant inventory compiled for the drainage area deemed most likely to impact drinking water quality at this public water supply raw water intake. This assessment found a moderate susceptibility to contamination for this source of drinking water. The amount of agricultural lands in the assessment area results in elevated potential for protozoa and disinfection byproduct precursor contamination. There is also a high density of sanitary wastewater discharges, which results in elevated susceptibility for nearly all contaminant categories.

There is also noteworthy contamination susceptibility associated with other discrete contaminant sources, and these facility types include: Toxics Release Inventory facilities, Chemical Bulk Storage facilities, inactive hazardous waste sites, landfills and Resource Conservation and Recovery Act facilities.”

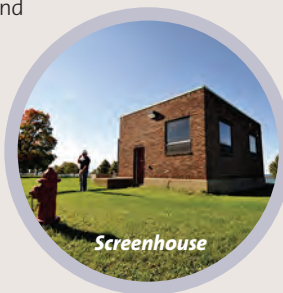
**If you have any questions about the state’s Source Water Assessment Program, please contact the Erie County Health Department at (716) 961-6800.**

## Water treatment process

Buffalo’s water intake is located in the northeastern region of Lake Erie, just upstream of the Niagara River. This region is known as the Emerald Channel, due to the sparkling clarity of its water. Water enters into the intake through 12 sluice gates and collects in a circular conduit and is conveyed by gravity down 60 feet into to a 12-foot diameter, mile-long tunnel burrowed under the lakebed. Chlorine may initially be applied in this conduit to control zebra and quagga mussels, and provide some disinfection of the water. The water is conveyed by gravity to an onshore screen house at the Colonel Francis G. Ward Pumping Station where traveling screens remove large objects such as fish and other debris that could potentially damage equipment.



Water continues to flow by gravity through the raw water conduit where fluoride and chlorine may be fed. Fluoride is added to guard against tooth decay, and chlorine is added at this location if the feed to the intake is suspended. Six low lift pumps control the amount of water withdrawn from Lake Erie depending on system demands. A poly-aluminum chloride (PACl) coagulant is fed and mixed immediately downstream of the low lift pumps. PACl is a coagulant designed to cause debris in the water to bind together forming floc. The treated water is conveyed into underground basins where flocculation and sedimentation processes occur. During flocculation, the water is slowly mixed by mechanical equipment to enhance floc formation. Following the flocculation process, water enters into the settling portion of the underground basins where the heavy floc is allowed to settle out by gravity. The treated water, still containing light floc, is conveyed to 40 rapid sand/anthracite



filter beds where the filtration process occurs, removing the light floc. A filter aid (PACl) can be added when necessary to enhance filtration and additional chlorine can also be added if needed. Filtered water then enters a 28 million gallon clearwell, where it is stored until needed in the distribution system.

The 40 filters need to be cleaned on a regular basis, which is accomplished by backwashing the filters with potable water. The backwash wastewater generated during the backwash process contains concentrated amounts of light floc removed by the filters. This wastewater is collected and pumped to gravity thickening clarifiers. Clarified backwash water is recycled to the raw water conduit, and the concentrated residuals generated during the thickening process are pumped to a storage lagoon and subsequently to a centrifuge for further processing.



Prior to potable water being pumped into the distribution system, a phosphate based corrosion inhibitor is added, which provides a protective layer inside service connections and plumbing systems, minimizing the potential for contaminants such as lead to leach into drinking water. High lift pumps located at the Colonel Ward and Massachusetts Pumping Stations deliver the treated water to the community. Our in-house laboratory tests the quality and safety of the water at every stage of the treatment process. Additional tests are conducted from samples taken throughout the City, including private homes, businesses and public facilities to ensure our water remains safe.

## Facts and figures

Water is essential for all life. Besides drinking, bathing and recreation, water is used to fight fires, and has countless industrial applications. The City of Buffalo treated over 25.1 billion gallons last year averaging over 68.1 million gallons each day for a population of approximately 260,000 people, covering 46 square miles of piping network. On our highest single day, August 30, 2017, we treated over 77.7 million gallons of water for distribution.

The distribution system consists of approximately 891 miles of water main pipe (not including hydrant laterals and service connections), 22,936 valves, 74,715 service connections and 7,970 fire hydrants. The distribution system is maintained, day and night, throughout all seasons. In the past year Buffalo Water has replaced or renovated approximately 2.24 miles of water mains and replaced 204 hydrants.



2017 TABLE OF DETECTED CONTAMINANTS		LOCATION	INORGANICS									
			Contaminant	Violation Yes/No	Date of Sample	Level Detected (Min/Max) (Range)	Unit Measurement	MCLG	Regulatory Limit (MCL, TT or AL)	Likely Source of Contamination		
Are there contaminants in our drinking water?	As the State regulations require, we routinely test your drinking water for numerous contaminants. These contaminants include: total coliform, turbidity, inorganic compounds, nitrate, nitrite, lead and copper, volatile organic compounds, total trihalomethanes, haloacetic acids, radiological and synthetic organic compounds. The following tables present which compounds were detected in your drinking water. The State allows us to test for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, is more than one year old.	ENTRY POINT	Barium	No	4/11/17, 10/25/17	18 - 20 Avg: 19	ppb	2	2000	Discharge of drilling wastes; discharge from metal refineries; and erosion of natural deposits		
			Fluoride	No	4/11/17, 10/25/17	90 - 110 Avg: 100	ppb	N/A	2200	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories		
			**Sodium	No	5/23/07	11	ppm	N/A	**	Naturally-occurring; road salt; water softeners; animal waste		
			Total Chromium	No	10/25/17	5.2	ppm	N/A	100	Naturally found in rocks, soil, lava dust and animals.		
			Nitrate	No	4/11/17, 10/25/17	130 - 340 Avg: 240	ppb	10	10000	Runoff from fertilizer use; Leaching from septic tanks, sewage, erosion of natural deposits		
			Nickel	No	4/11/17, 10/25/17	1.6 - 2.1 Avg: 1.85	ppb	100	100	Nickel can be released into the environment by power plants, metal factories and incinerators. It is also found in runoff from fertilizer use.		
It should be noted that all drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.	More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800) 426-4791 or the Erie County Health Department at (716) 961-6800.	DISTRIBUTION	Copper <sup>(1)</sup>	No 90% = 67.5	6/6/17-9/23/17	ND - 312 Avg: 28.3	ppb	0	AL = 1300	Corrosion of household plumbing; erosion of natural deposits; leaching from wood preservatives		
			Lead <sup>(1)</sup>	No 90% = 4.5	6/6/17-9/23/17	ND - 8.4 Avg: 1.4	ppb	0	AL = 15	Corrosion of household plumbing; erosion of natural deposits		
			MICROBIOLOGICAL									
			Heterotrophic Bacteria	No	1/3/17-2/27/17	0-500 Avg: 3.8	count / ml	N/A	N/A	N/A	Naturally occurring	
			Turbidity <sup>(2)</sup>	No	1/3/17-2/27/17	0.05 - 0.54 Avg: 0.12	NTU	N/A	≤ 5.0	Soil runoff		
			Turbidity <sup>(3)</sup>	No	1/3/17-2/27/17	0.07 - 0.55 Avg: 0.12	NTU	N/A	≤ 1.0			
No	99.9% < 0.3	NTU		N/A		TT: 95% ≤0.3						
Footnotes for table of detected contaminants: ** Water containing more than 20 mg/l of sodium should not be used for drinking by anyone on severely restricted sodium diets. Water containing more than 270 mg/l of sodium should not be used for drinking by people on moderately restricted sodium diets.	(1) In 2017, 85 homes were tested during the compliance period of June 1, 2017 through September 30, 2017. No sample results were above the action level (AL) of 15 ppb for lead or 1.3 ppm for copper. The treatment technique (TT) employed by Buffalo Water, intended to reduce lead and copper contamination of drinking water is the addition of a poly/orthophosphate blend as a part of water treatment. This chemical serves to coat water lines, to prevent lead and copper from leaching into the drinking water. Ingesting copper in excess of the 1.3 ppm AL may result in gastrointestinal distress. Long term exposure to copper above the 1.3 ppm AL may result in liver or kidney damage. Infants and children who drink water containing lead in excess of the AL could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning disabilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Infants and young children are more vulnerable to lead in drinking water than the general population. Lead levels in your home might be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested, and you should flush your tap for thirty seconds to two minutes (or until you feel a change in water temperature) before using your tap water. Additional information is available from the Safe Drinking Water Hotline (800) 426-4791, and on Buffalo Water's website. Compliance testing for lead and copper will occur during the summer of 2020.	ENTRY POINT	Heterotrophic Bacteria	No	1/3/17-2/27/17	ND-8 Avg: 0.06	count / ml	N/A	N/A	Naturally occurring		
			TOTAL AND FREE CHLORINE RESIDUALS - DISINFECTANTS									
			Total Chlorine	No	1/1/17-12/31/17	1.2 - 1.74 Avg: 1.42	ppm	N/A	N/A	Water additive used to control microbes		
			Free Chlorine	No	1/1/17-12/31/17	0.97 - 1.5 Avg: 1.14	ppm	(MRDLG) 4.0	(MRDLG) 4.0			
			Free Chlorine	No	1/1/17-12/31/17	0.08 - 1.47 Avg: 0.86	ppm	(MRDLG) 4.0	(MRDLG) 4.0			
			(2) Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. Our highest single distribution measurement for 2017 occurred on August 14, 2017 ( 0.59 NTU). State regulations require that the distribution average monthly turbidity must be below 5.0 NTU.	(3) The regulations also require that 95% of the effluent turbidity samples collected have measurements below 0.3 NTU and that no single turbidity measurement be above 1.0 NTU. Although January had the highest effluent turbidity measurement, 99.9% of all measurements for all of the months met the TT for turbidity (0.3 NTU), and were in the acceptable range allowed and did not constitute a violation.	DISTRIBUTION	DISINFECTION BYPRODUCTS						
TTHM <sup>(4)</sup>	No	2/14/17-11/13/17				19.5 - 53.5 RAA = 31.26	ppb	N/A	80	By-product of drinking water chlorination needed to kill harmful microorganisms. TTHMs are formed when source water contains large amounts of organic matter.		
HAA	No	2/14/17-11/13/17				9.4 - 20.9 RAA = 15.5	ppb	N/A	60	By-product of drinking water disinfection needed to kill harmful microorganisms		
TOC	No	1/10/17-12/12/17				1.2 - 2.7 Avg: 1.77	ppm	N/A	TT < 2.0	Precursors to by-products of drinking water chlorination		
SUVA	No	1/10/17-12/12/17				0.56 - 1.42 Avg: 1.05	L/mg-m	N/A	TT < 2.0			
OTHER PROPERTIES OF WATER												
(4) Representative testing for TTHM included samples collected through 2017. Our highest detected reading occurred on August 15, 2017, 53.3 ppb, which was below the MCL of 80 ppb. Some people who drink water, containing TTHM in excess of the MCL over many years, experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.	What does this information mean? As presented in the Table of Detected Contaminants, our system had no violations for the parameters referenced. We have learned through our testing that some contaminants have been detected; however, these contaminants were detected below the level allowed by the State.	ENTRY POINT	Total Solids	No	1/27/16-12/20/16	149 - 186 Avg: 168.13	ppm	N/A	N/A	Naturally occurring		
			Total Dissolved Solids	No	1/27/16-12/23/16	94 - 177 Avg: 155.8	ppm	N/A	N/A			
			Alkalinity (as CaCO <sub>3</sub> )	No	1/13/16-12/30/16	91 - 98 Avg: 93.58	ppm	N/A	N/A			
			Calcium Hardness (as CaCO <sub>3</sub> )	No	1/13/16-12/30/16	84 - 126 Avg: 116	ppm	N/A	N/A			
			pH	No	1/1/16-12/31/16	7.4 - 7.9 Avg: 7.7	SU	N/A	N/A			
			pH	No	1/4/16-12/29/16	7.0 - 8.1 Avg: 7.62	SU	N/A	N/A			
UNDETECTED CONTAMINANTS: According to State regulations, Buffalo Water routinely monitors your drinking water for various contaminants. Your water is tested for inorganic contaminants, nitrate, lead and copper, volatile organic contaminants, synthetic organic contaminants and total trihalomethanes. Additionally, your water is tested for coliform bacteria a minimum of 150 times a month. The contaminants detected in your drinking water are included in the Table of Detected Contaminants. Below is a list of contaminants that were tested for in 2017, but were not detected in our drinking water: 2,3,7,8-TCDD, 2,4,5-T, 2,4-D, 3-Hydroxycarbofuron, Alachlor, Aldicarb, Aldicarb Sulfoxide, Aldicarb Sulfone, Aldrin, Aluminum, Antimony, Butachlor, Cadmium, Carbaryl, Carbofuran, Chlordane, Cyanide,	Thank you for allowing us to continue to provide your family with quality drinking water this year. We ask that all our customers help us protect our water sources, which are the heart of our community. A copy of the Annual Water Quality Report can be found on Buffalo Water's website (www.buffalowater.org). Please call our treatment plant supervisor at (716) 847-1065 ext. 130 or the laboratory at (716) 847-1065 ext. 133 if you have questions about water quality. As always, if you are concerned about elevated levels of lead in your home's plumbing, please contact Mayor Byron W. Brown's 3-1-1 Call and Resolution Center to have your water tested for lead by Buffalo Water.	DISTRIBUTION	UNREGULATED CONTAMINANT MONITORING RULE (UCMR3)									
			Molybdenum	No	3/10/15-6/10/15	1-1.2 (Average 1.1)	ppb	N/A	N/A		N/A	Naturally occurring and industrial processes
			Strontium	No	3/10/15-6/10/15	160-160 (Average 160)	ppb	N/A	N/A		N/A	Naturally occurring
			Chromium, Hexavalent	No	3/10/15-6/10/15	50-90 (Average 70)	ppt	N/A	N/A	N/A	Naturally occurring and industrial processes	
			4-Androstene-3,17dione	No	3/10/15-6/10/15	.7	ppt	N/A	N/A	N/A	Steroid Hormone	
			Molybdenum	No	3/10/15-6/10/15	1.0-1.1 (Average 1.05)	ppb	N/A	N/A	N/A	N/A	Naturally occurring and industrial processes
Strontium	No	3/10/15-6/10/15	150-160 (Average 155)	ppb	N/A	N/A	N/A	N/A	Naturally occurring			
Chromium, Hexavalent	No	3/10/15-6/10/15	100	ppt	N/A	N/A	N/A	N/A	Naturally occurring and industrial processes			

Dalapan, Di(2-ethylhexyl)adipate, Dicamba, Dichlorprop, Dieldrin, Dinoseb, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Mercury, Methomyl, Methoxychlor, Metolachlor, Metribuzin, Nitrite as Nitrogen, Oxamyl, Pentachlorophenol, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, Pichloram, Polychlorinated biphenyls, Propachlor, Selenium, Silvex(2,4,5-TP), Simazine, Thallium, Toxaphene

Is our water system meeting other rules that govern operations?

Monitoring Violations

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During 2017, our system was in compliance with applicable state drinking water operations, monitoring, and reporting requirements.

Do I need to take special precautions?

Some people may be more vulnerable to disease causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care provider about their drinking water.

EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the Safe Drinking Water Hotline (800) 426-4791.

Information on fluoride addition

Our system is one of the many drinking water systems in New York State that provides drinking water with a controlled, low level of fluoride for consumer dental health protection. According to the United States Centers for Disease Control (CDC), fluoride is very effective in preventing cavities when present in drinking water at a properly controlled level. To ensure that the fluoride supplement in your water provides optimal dental protection, we monitor fluoride levels on a daily basis to make sure fluoride is maintained at a target level of 0.7 mg/l.

Currently there is an interruption to fluoride addition due to capital improvements associated with upgrades to our fluoride system. Since June 22, 2015 fluoride has not been added to your drinking water, and we do not expect fluoride addition to be restored until December, 2018. You may want to discuss this with your family dentist to see if some other form of fluoride supplement should be considered for your dental protection.

Why save water and how to avoid wasting it?

Although our system has an adequate amount of water to meet present and future demands, there are a number of reasons why it is important to conserve water:

- Saving water saves energy and some of the costs associated with both of these necessities of life
- Saving water reduces the cost of energy required to pump water and the need to construct costly new wells, pumping systems and water towers; and
- Saving water lessens the strain on the water system during a dry spell or drought, helping to avoid severe water use restrictions so that essential firefighting needs are met.

You can play a role in conserving water by becoming conscious of the amount of water your household is using, and by looking for ways to use less whenever you can. It is not hard to conserve water. Conservation tips include:

- Run only full loads in the washing machine and dishwasher. This saves 300 to 800 gallons per month.
- Turn off the tap when brushing your teeth and shaving. This saves three gallons each day.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank, watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an otherwise invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Put a plastic bottle or a plastic bag weighted with pebbles and filled with water in your toilet tank. Displacing water in this manner allows you to use less water with each flush. Saves 5 to 10 gallons a day. That's up to 300 gallons a month, even more for large families. Better yet, for even greater savings, replace your water-guzzling 5-7 gallon a flush toilet with a 1.6 gallon, low flush, or 1.28 gallon, ultra-low flush model.
- Avoid flushing the toilet unnecessarily. Dispose of tissues, insects and other similar waste in the trash rather than the toilet.
- Retrofit all household faucets by installing aerators with flow restrictors to slow the flow of water.
- Don't run the hose while washing your car. Use a bucket of water and a quick hose rinse at the end which may save 150 gallons each time. For a two-car family that's up to 1,200 gallons a month.
- Place a bucket in the shower to catch excess water and use this to water plants. The same technique can be used when washing dishes or vegetables in the sink.

- Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances, then check the meter after 15 minutes, if it moved, you have a leak.

System Improvements

To insure continuing quality and safety in our communities' water supply, Buffalo Water has made the following improvements to our treatment facility in 2017:

- Security and sight lighting improvements were further implemented at the Colonel Ward and Massachusetts Avenue Pumping Stations.
- Electrical upgrades continued at the Colonel Ward Pump Station valve house to improve electrical service throughout the building.
- Ongoing improvements associated with upgrading to energy efficient lighting, heating and cooling continued through 2017.
- Mechanical upgrades continue to the high service pumps at Colonel Ward and Massachusetts Avenue Pumping Stations.
- In the distribution system, 204 fire hydrants were replaced and hydrant marker installation increased through additional areas of the City.
- Mechanical and electrical improvements continued at the Manhattan Tank Pumping Station.
- Commissioning of a newly constructed treated backwash wastewater dechlorination system.
- Roof repairs were completed at the Massachusetts Avenue Pumping Station and Service Garage.
- Distribution system improvements including a large valve replacement project, water cut restoration, and rehabilitation/ replacement of water mains.
- Continued the City's pilot program for annual lead and copper monitoring with increased customer awareness.
- Electrical improvements were completed that were associated with the Massachusetts Avenue electrical substation high voltage circuit breaker.
- A state-of-the-art pipe loop pilot plant was constructed, facilitating academic research of various corrosion prevention technologies.
- Construction of two new fiberglass reinforced polyester coagulant storage tanks.
- An optimal corrosion control study commenced, which will evaluate the treatment process and distribution system.
- Construction activities to install a new water main under the City Ship Canal at Michigan Avenue commenced.

An absolute commitment to produce the best quality of drinking water available will remain highest priority for Buffalo Water. The planned improvements for 2018 demonstrate this commitment:

- Control system upgrades will continue. The improved monitoring systems will optimize control over water treatment and plant pumping systems.
- Over 120 hydrants are scheduled to be replaced.
- Coagulant system upgrades including a pilot project utilizing streaming current monitoring and in-line rapid mixing is anticipated, improving overall water treatment process efficiency.
- Mechanical upgrades to high service pumps at the Colonel Ward Pumping Stations will continue.
- Installation of a new water main under the City Ship Canal at Michigan Avenue will continue
- Mechanical and electrical improvements at the Manhattan Tank Pumping Station are anticipated to be completed.
- Building envelope improvements at the Colonel Ward and Massachusetts Avenue Pumping Stations.
- Improve accuracy of metering program by replacing specific groups of meters.
- An optimal corrosion control study will continue.

Metering program

The New York State's Department of Environmental Conservation has mandated that all households and businesses served by Buffalo Water have a water meter installed to insure equitable billing and to foster water conservation. The water meters installed under this program, are read from outside your residence, and accurately bill for the water that has been used, the same way you are currently billed by other utilities. Buffalo Water currently reads and bills metered accounts quarterly. Bills are processed and mailed within approximately 30 days following the previous quarter. If your meter is stopped, or we cannot read your meter, you may receive an estimated bill, which could result in an inaccurate bill. If you receive a notice regarding a problem with your meter, or an estimated bill, you should contact customer service at (716) 847-1065.

Closing

Thank you for allowing us to continue to provide your family with quality drinking water this year. We ask that all our customers help us protect our water sources, which are the heart of our community. A copy of the Annual Water Quality Report can be found on Buffalo Water's website (www.buffalowater.org). Please call our treatment plant supervisor at (716) 847-1065 ext. 130 or the laboratory at (716) 847-1065 ext. 133 if you have questions about water quality. As always, if you are concerned about elevated levels of lead in your home's plumbing, please contact Mayor Byron W. Brown's 3-1-1 Call and Resolution Center to have your water tested for lead by Buffalo Water.

Dalapan, Di(2-ethylhexyl)adipate, Dicamba, Dichlorprop, Dieldrin, Dinoseb, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Mercury, Methomyl, Methoxychlor, , Metolachlor, Metribuzin,Nitrite as Nitrogen, Oxamyl, Pentachlorophenol, PCB-1016,PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, Pichloram, Polychlorinated biphenyls, Propachlor, Selenium, Silvex(2,4,5-TP), Simazine, Thallium, Toxaphene

### Is our water system meeting other rules that govern operations?

#### Monitoring Violations

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During 2017, our system was in compliance with applicable state drinking water operations, monitoring, and reporting requirements.

### Do I need to take special precautions?

Some people may be more vulnerable to disease causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care provider about their drinking water.

EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the Safe Drinking Water Hotline (800) 426-4791.

### Information on fluoride addition

Our system is one of the many drinking water systems in New York State that provides drinking water with a controlled, low level of fluoride for consumer dental health protection. According to the United States Centers for Disease Control (CDC), fluoride is very effective in preventing cavities when present in drinking water at a properly controlled level. To ensure that the fluoride supplement in your water provides optimal dental protection, we monitor fluoride levels on a daily basis to make sure fluoride is maintained at a target level of 0.7 mg/l.

Currently there is an interruption to fluoride addition due to capital improvements associated with upgrades to our fluoride system. Since June 22, 2015 fluoride has not been added to your drinking water, and we do not expect fluoride addition to be restored until December, 2018. You may want to discuss this with your family dentist to see if some other form of fluoride supplement should be considered for your dental protection.

### Why save water and how to avoid wasting it?

Although our system has an adequate amount of water to meet present and future demands, there are a number of reasons why it is important to conserve water:

- Saving water saves energy and some of the costs associated with both of these necessities of life
- Saving water reduces the cost of energy required to pump water and the need to construct costly new wells, pumping systems and water towers; and
- Saving water lessens the strain on the water system during a dry spell or drought, helping to avoid severe water use restrictions so that essential firefighting needs are met.

You can play a role in conserving water by becoming conscious of the amount of water your household is using, and by looking for ways to use less whenever you can. It is not hard to conserve water. Conservation tips include:

- Run only full loads in the washing machine and dishwasher. This saves 300 to 800 gallons per month.
- Turn off the tap when brushing your teeth and shaving. This saves three gallons each day.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank, watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from an otherwise invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Put a plastic bottle or a plastic bag weighted with pebbles and filled with water in your toilet tank. Displacing water in this manner allows you to use less water with each flush. Saves 5 to 10 gallons a day. That's up to 300 gallons a month, even more for large families. Better yet, for even greater savings, replace your water-guzzling 5-7 gallon a flush toilet with a 1.6 gallon, low flush, or 1.28 gallon, ultra-low flush model.
- Avoid flushing the toilet unnecessarily. Dispose of tissues, insects and other similar waste in the trash rather than the toilet.
- Retrofit all household faucets by installing aerators with flow restrictors to slow the flow of water.
- Don't run the hose while washing your car. Use a bucket of water and a quick hose rinse at the end which may save 150 gallons each time. For a two-car family that's up to 1,200 gallons a month.
- Place a bucket in the shower to catch excess water and use this to water plants. The same technique can be used when washing dishes or vegetables in the sink.

- Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances, then check the meter after 15 minutes, if it moved, you have a leak.

### System Improvements

To insure continuing quality and safety in our communities' water supply, Buffalo Water has made the following improvements to our treatment facility in 2017:

- Security and sight lighting improvements were further implemented at the Colonel Ward and Massachusetts Avenue Pumping Stations.
- Electrical upgrades continued at the Colonel Ward Pump Station valve house to improve electrical service throughout the building.
- Ongoing improvements associated with upgrading to energy efficient lighting, heating and cooling continued through 2017.
- Mechanical upgrades continue to the high service pumps at Colonel Ward and Massachusetts Avenue Pumping Stations.
- In the distribution system, 204 fire hydrants were replaced and hydrant marker installation increased through additional areas of the City.
- Mechanical and electrical improvements continued at the Manhattan Tank Pumping Station.
- Commissioning of a newly constructed treated backwash wastewater dechlorination system.
- Roof repairs were completed at the Massachusetts Avenue Pumping Station and Service Garage.
- Distribution system improvements including a large valve replacement project, water cut restoration, and rehabilitation/ replacement of water mains.
- Continued the City's pilot program for annual lead and copper monitoring with increased customer awareness.
- Electrical improvements were completed that were associated with the Massachusetts Avenue electrical substation high voltage circuit breaker.
- A state-of-the-art pipe loop pilot plant was constructed, facilitating academic research of various corrosion prevention technologies.
- Construction of two new fiberglass reinforced polyester coagulant storage tanks.
- An optimal corrosion control study commenced, which will evaluate the treatment process and distribution system.
- Construction activities to install a new water main under the City Ship Canal at Michigan Avenue commenced.

An absolute commitment to produce the best quality of drinking water available will remain highest priority for Buffalo Water. The planned improvements for 2018 demonstrate this commitment:

- Control system upgrades will continue. The improved monitoring systems will optimize control over water treatment and plant pumping systems.
- Over 120 hydrants are scheduled to be replaced.
- Coagulant system upgrades including a pilot project utilizing streaming current monitoring and in-line rapid mixing is anticipated, improving overall water treatment process efficiency.
- Mechanical upgrades to high service pumps at the Colonel Ward Pumping Stations will continue.
- Installation of a new water main under the City Ship Canal at Michigan Avenue will continue
- Mechanical and electrical improvements at the Manhattan Tank Pumping Station are anticipated to be completed.
- Building envelope improvements at the Colonel Ward and Massachusetts Avenue Pumping Stations.
- Improve accuracy of metering program by replacing specific groups of meters.
- An optimal corrosion control study will continue.

### Metering program

The New York State's Department of Environmental Conservation has mandated that all households and businesses served by Buffalo Water have a water meter installed to insure equitable billing and to foster water conservation. The water meters installed under this program, are read from outside your residence, and accurately bill for the water that has been used, the same way you are currently billed by other utilities. Buffalo Water currently reads and bills metered accounts quarterly. Bills are processed and mailed within approximately 30 days following the previous quarter. If your meter is stopped, or we cannot read your meter, you may receive an estimated bill, which could result in an inaccurate bill. If you receive a notice regarding a problem with your meter, or an estimated bill, you should contact customer service at (716) 847-1065.

### Closing

Thank you for allowing us to continue to provide your family with quality drinking water this year. We ask that all our customers help us protect our water sources, which are the heart of our community. A copy of the Annual Water Quality Report can be found on Buffalo Water's website (www.buffalowater.org). Please call our treatment plant supervisor at (716) 847-1065 ext. 130 or the laboratory at (716) 847-1065 ext. 133 if you have questions about water quality. As always, if you are concerned about elevated levels of lead in your home's plumbing, please contact Mayor Byron W. Brown's 3-1-1 Call and Resolution Center to have your water tested for lead by Buffalo Water.



281 Exchange Street  
Buffalo, NY 14204



# Operation and Maintenance Summary

## O&M SUMMARY

### **Aboveground Asset Management - Oracle Work and Asset Management (OWAM) Contract Year 8 Summary:**

- All weekly, monthly, quarterly, semi-annual, annual, and pent-annual PM activities continue to be maintained in OWAM.
- PM work continues to evolve on existing assets. As new assets are brought into OWAM, they are assessed and appropriate PM work is assigned. Work orders are added and task instructions are continually revised to ensure equipment is receiving appropriate preventative and corrective maintenance.
- Hours required for work order tasks are inputted into OWAM and are tracked for each asset.
- Hach WIMS continues to be developed to include residuals processing operations performance metrics and updated data entry forms.
- Continue to maintain and update all PM Masters to reflect appropriate “Lead Crews” and “Schedule Types”. Updated schedules for all weekly and monthly PM Masters.
- Continued service contract with Hach for PM on all process related instrumentation in the filtration plant.
- Continue to perform PM tasks associated with building inspections for different areas each week, and continue to perform on a monthly schedule.
- Continue to develop OWAM database to include documentation for assets requiring renewal of certifications.
- Maintain PM and bump testing for MSA gas monitors.

## **Underground Asset Management - InfoNet Contract Year 8 Summary:**

- Continued to use InfoNet mobile for use in routine hydrant maintenance and leak detection.
- Utilized previously developed queries for:
  - All festival and event areas where hydrants are inspected and serviced annually.
  - Dead end hydrant and three-day flushing programs.
  - Hydrant inspection district for routine hydrant maintenance.
- Updated district and festival maps identifying updated locations of pipes, hydrants, and valves.
- Updated choices lists in InfoNet to assist with uniform data information for updates.
- Developed additional and maintained existing queries to create dynamic tables allowing users to review incomplete work orders and missing asset information. Upon running the query, a user is provided with a list of open work orders or assets that require additional information.
- Continue to work with Distribution Superintendent and Assistant Superintendents to maintain proper scheduling, completing, and reviewing of work orders.
- Continued to update completed Capital Projects in InfoNet.
- Assisted City with changes to consultant agreements that require capital project closeout to include transfer of water infrastructure specific data for subsequent inclusion into InfoNet.
- Hydrant district maps were updated with current asset information.
- Provide training to City of Buffalo personnel in basic InfoNet functionality including, but not limited to:
  - Basic navigation of InfoNet geodatabase
  - Explanation of look up and search functions to find information on assets and work orders
  - Step by step instructions for connecting to the Veolia Network and utilizing GIS data
- Outfitted the service garage with wifi and connectivity to Veolia networks, in conjunction with several distribution vehicles with BAK Atlas mobile devices enabling personnel to have updated mapping when entering and leaving the service garage.

# Water Pumpage History by Fiscal Year

	1996(1,3)		1997(1)		1998(1)		1999(2)		2000		2001		2002	
	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished
January			3.2000	3.1000	2.9000	2.7000	3.3000	3.2000	2.9900	2.9530	3.2080	3.1530	2.8870	2.8160
February			2.8000	2.7000	2.6000	2.3000	3.0000	2.9000	2.9540	2.9150	3.0000	2.9700	2.6226	2.5569
March			3.1000	3.0000	2.8000	2.6000	3.4000	3.3000	3.2090	3.1670	3.0016	2.9680	3.0863	3.0257
April			2.8000	2.7000	2.8000	2.4000	2.9000	2.8000	2.9770	2.9390	2.8625	2.7816	2.9193	2.8600
May			2.9000	2.8000	2.9000	2.6000	3.1000	3.0000	2.9700	2.9410	2.8950	2.8550	2.7250	2.6594
June			2.9000	2.8000	2.9000	2.6000	3.4000	3.3000	2.8500	2.8180	2.9427	2.9107	2.8896	2.8371
July	3.3000	3.2000	3.1000	3.0000	3.0000	2.8000	3.5000	3.4000	3.3610	3.3310	3.1990	3.1710	3.3812	3.3335
August	3.4000	3.3000	3.1000	3.0000	3.0000	2.9000	3.4000	3.3000	3.1990	3.1720	3.4480	3.4110	3.1235	3.0907
September	3.1000	3.0000	2.7000	2.6000	2.8000	2.6000	3.2000	3.1000	2.9590	2.9300	2.9374	2.9010	3.1632	3.1206
October	3.0000	2.9000	2.8000	2.6000	2.8000	2.6000	3.0000	2.9000	3.0630	3.0280	2.7493	2.6937	3.3560	3.2990
November	2.8000	2.7000	2.7000	2.5000	2.8000	2.4000	3.4000	3.3000	2.6830	2.6380	2.7884	2.7198	2.7591	2.7033
December	3.0000	2.9000	2.9000	2.7000	2.9000	2.5000	3.0800	3.0500	2.9580	2.9130	2.9893	2.9339	3.0120	2.9450
Total/yr (Bgals)	18.6000	18.0000	35.0000	33.5000	34.2000	31.0000	38.6800	37.5500	36.1730	35.7450	36.0211	35.4687	35.9246	35.2473
Avg./mo (Bgals)	3.1000	3.0000	2.9167	2.7917	2.8500	2.5833	3.2233	3.1292	3.0144	2.9788	3.0018	2.9557	2.9937	2.9373
Avg./day (Gals)	101,917,808	98,630,137	95,890,411	91,780,822	93,698,630	84,931,507	105,972,603	102,876,712	99,104,110	97,931,507	98,688,000	97,174,548	98,423,644	96,567,973
Finished water pumpage by fiscal year (BG)			7/96-6/97	35.1000	7/97-6/98	31.6000	7/98-6/99	34.3000	7/99-6/00	36.8	7/00-6/01	35.6503	7/01-6/02	34.5857
											97,671,945			94,755,205

(1) pumpage based on wire/water estimate, not venturi readings  
(2) pumpage corrected to report actual reads from venturi meters  
(3) data prior to July not available

	2003		2004		2005		2006		2007		2008		2009	
	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished
January	2.98118	2.91051	2.58848	2.51305	2.51909	2.49510	2.37700	2.31800	2.08389	2.05389	2.15159	2.11479	2.09766	2.06706
February	2.87680	2.82313	2.44999	2.40626	2.46263	2.38050	2.13729	2.09522	2.08241	2.04675	2.10626	2.06940	1.94497	1.90527
March	3.13013	3.08296	2.55828	2.52258	2.59835	2.54392	2.42694	2.37091	2.46973	2.42109	2.21370	2.16500	2.13311	2.08965
April	3.19553	3.14723	2.36731	2.32204	2.34500	2.28000	2.29625	2.24679	2.27601	2.24171	1.96087	1.92127	1.99865	1.95488
May	2.82829	2.78303	2.36400	2.32300	2.59181	2.54268	2.36700	2.32700	2.19117	2.14487	1.94264	1.90891	2.03398	2.00261
June	2.72620	2.67810	2.37000	2.33559	2.52661	2.47721	2.23507	2.20290	2.20715	2.17145	1.90310	1.87366	1.91508	1.88481
July	3.11400	3.06500	2.59231	2.54681	2.66795	2.63698	2.34358	2.34176	2.33041	2.29078	2.10537	2.07277	1.99002	1.95982
August	2.98306	2.94816	2.44944	2.40751	2.48887	2.45997	2.70970	2.37863	2.35527	2.31603	2.10024	2.06707	1.99535	1.94975
September	2.90660	2.87166	2.33929	2.31512	2.48591	2.24922	2.12676	2.09602	2.10812	2.07385	1.91967	1.89070	1.87523	1.82969
October	2.85090	2.79300	2.50054	2.46244	2.14618	2.11818	2.12360	2.09343	2.06131	2.02324	1.91003	1.87966	1.81088	1.77681
November	2.40725	2.33818	2.43555	2.39165	2.01260	1.97110	1.97186	1.96743	1.90891	1.87618	1.81694	1.78904	1.53374	1.52621
December	2.53642	2.43232	2.59295	2.47700	2.35508	2.28765	2.02980	1.99816	2.04115	2.00618	2.02736	1.99222	1.81085	1.65969
Total-Calendar yr (Bgals)	34.5364	33.8733	29.6081	29.0231	29.2001	28.4425	27.1449	26.4363	26.1155	25.6660	24.15777	23.74449	23.13952	22.60625
Avg./mo (Bgals)	2.8780	2.8228	2.4673	2.4186	2.4333	2.3702	2.2621	2.2030	2.1763	2.1388	2.01315	1.97871	2.10359	2.05511
Avg./day (Gals)	94,620,164	92,803,507	81,118,192	79,515,205	80,000,219	77,924,685	74,369,452	72,428,085	71,549,403	70,317,868	66,185,671	65,053,397	69,159,210	67,565,386
Fiscal Year (BG)	7/02-6/03	35.92	7/03-6/04	30.87	7/04-6/05	29.32	7/05-6/06	27.28	7/06-6/07	25.96	7/07-6/08	24.64	7/08-6/09	23.60

\*Finished flows adjusted for recirc volume-start Dec 04

\*Note:update average gals monthly using curent # months/days

	2010		2011		2012		2013		2014		2015		2016	
	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished
January	1.92966	1.89702	2.17480	1.82418	2.05052	1.87891	2.09837	1.66261	2.41966	2.37030	2.34181	2.30569	2.28212	2.23150
February	1.78491	1.75698	2.06542	1.73788	1.93626	1.81758	2.05456	1.65294	2.41399	2.32927	2.25591	2.11557	2.21313	2.12177
March	1.89788	1.86445	2.25923	1.93075	2.06726	1.80098	2.19388	2.01211	2.60423	2.44346	2.62768	2.51032	2.33306	2.24253
April	2.18968	1.73588	2.10585	1.76037	1.94625	1.68650	2.05149	1.81561	2.37444	2.20132	2.35186	2.31861	2.19169	2.12227
May	2.25965	1.80981	2.07581	1.75104	2.06210	1.77976	2.09809	1.92308	2.28397	2.18310	2.31007	2.27451	2.21993	2.12398
June	2.15979	1.76774	2.04872	1.75953	2.06822	1.87176	2.03913	1.91283	2.16899	2.02494	2.20176	2.11539	2.20224	2.14599
July	2.29494	1.93532	2.25097	1.95329	2.29188	2.02992	2.24965	2.11995	2.26730	2.07593	2.23494	2.17800	2.36153	2.33399
August	2.34766	2.05622	2.14000	1.94000	2.23028	2.11912	2.21045	2.10932	2.22409	2.17302	2.25877	2.19187	2.29512	2.24867
September	2.13116	1.72582	1.97035	1.76294	1.99618	1.91303	2.01339	1.93967	2.04075	1.96015	2.16927	2.10627	2.05054	2.00968
October	2.07184	1.68340	1.94237	1.71615	1.95058	1.65706	2.01670	1.95380	2.05570	2.02120	2.14308	2.03722	2.06080	2.00137
November	2.00090	1.61628	1.87127	1.61908	1.86650	1.49839	1.94575	1.89817	2.01038	1.98235	2.04163	1.98083	1.96505	1.78416
December	2.16032	1.74236	1.95403	1.75775	1.95017	1.62954	2.10876	2.10430	2.13049	2.10639	2.11026	2.06866	2.11868	2.07854
Total-Calendar yr (Bgals)	25.2284	21.5913	24.8588	21.5129	24.4162	21.6825	25.0802	23.1089	26.9940	25.8714	27.04703	26.20294	26.29387	25.44445
Avg./mo (Bgals)	2.1024	1.7993	2.0716	1.7927	2.0347	1.8069	2.0900	1.9257	2.2495	2.1560	2.25392	2.18358	2.39035	2.31313
Avg./day (Gals)	69,118,834	59,154,174	68,106,297	58,939,556	66,893,688	59,404,241	68,712,938	63,312,030	73,956,140	70,880,628	74,101,458	71,788,866	78,586,914	76,048,175
Fiscal Year (BG)	7/09-6/10	21.53	7/10-6/11	21.52	7/11-6/12	21.58	7/12-6/13	21.83	7/13-6/14	25.68	7/14-6/15	25.96	7/15-6/16	25.55

\*Finished flows adjusted for recirc volume-start Dec 04

\*Note:update average gals monthly using curent # months/days

	2017		2018		2019		2020		2021		2022		2023	
	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished
January	2.2132	2.09695	2.4252	2.2470										
February	2.0086	1.96891	2.1116	2.0428										
March	2.1723	2.13253	2.2501	2.1620										
April	2.0557	2.00217	2.1166	2.0677										
May	2.0767	2.03521	2.1566	2.0490										
June	2.0487	1.98080	2.1096	2.0662										
July	2.1527	2.1696												
August	2.2094	2.19415												
September	2.0142	1.9797												
October	2.0294	1.9982												
November	1.9797	1.8142												
December	2.1188	1.9044												
Total-Calendar yr (Bgals)	25.0793	24.2768	13.1697	12.6347	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.00000	0.00000	0.00000
Avg./mo (Bgals)	2.0899	2.0231	1.0975	1.0529	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.00000	0.00000	0.00000
Avg./day (Gals)	68,710,446	66,511,735	36,081,442	34,615,654	0	0	0	0	0	0	0	0	0	0
Fiscal Year (BG)	7/09-6/10	24.67	7/10-6/11	24.69	7/11-6/12	0.00	7/12-6/13	0.00	7/13-6/14	0.00	7/14-6/15	0.00	7/15-6/16	0.00

\*Finished flows adjusted for recirc volume-start Dec 04

\*Note:update average gals monthly using curent # months/days



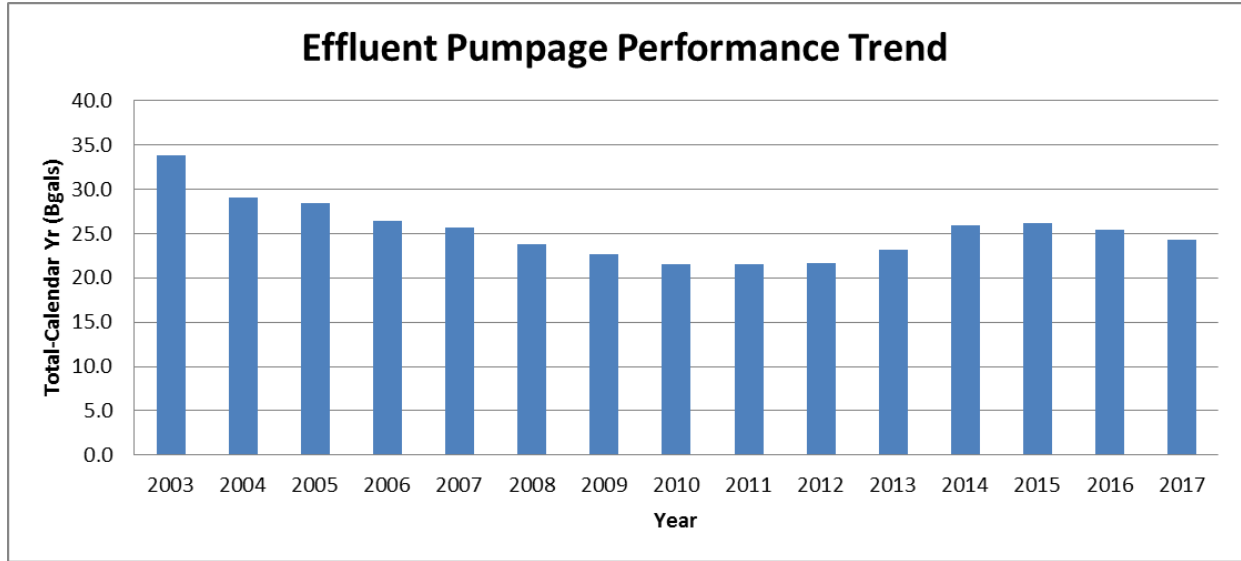


Figure shows effluent pumping trends over the course of the last 15 years.

YEAR	TOTAL-CALENDAR YR (Bgals)		Difference (Bgals) From Previous Year
	Raw	Effluent	
2003	34.536	33.873	
2004	29.608	29.023	-4.850
2005	29.200	28.443	-0.581
2006	27.145	26.436	-2.006
2007	26.116	25.666	-0.770
2008	24.158	23.744	-1.922
2009	23.140	22.606	-1.138
2010	25.228	21.591	-1.015
2011	24.859	21.513	-0.078
2012	24.416	21.683	0.170
2013	25.080	23.109	1.426
2014	26.994	25.871	-2.763
2015	27.047	26.203	-0.332
2016	26.294	25.444	0.758
2017	25.079	24.277	1.168

# Capital Improvement Recommendations Report

## CAPITAL IMPROVEMENT RECOMMENDATIONS

This plan was developed in collaboration with the City of Buffalo, Division of Water and engineering consultants retained by the City of Buffalo.

	SIX YEAR								
	CAPITAL IMPROVEMENT PLAN OF THE BUFFALO WATER SYSTEM								
	(IN THOUSANDS OF DOLLARS)								
PROJECT CATEGORY	PROJECT NO.	PROJECT NAME	2018	2019	2020	2021	2022	2023	2024
Colonel Ward Treatment and Pumping	1	Filter Plant Treatment Optimization			200	500			
	2	Filter Plant Lagoon Rehabilitation	300	2,000					
	3	Filter Plant Sedimentation Basin Improvements			100	600			
	4	Filter Plant Filter Media Replacement / Rehab	300	1,700					
	5	Filter Plant Laboratory Improvements							
	6	Filter Plant PAC tanks / Corrosion Control Tanks	350	1,800					
	7	Flocculation motors							
	8	Filter Plant New Screens	250	2,000					
	9	Thickener Rehab including Tube Settlers		200	700				
	10	Sodium Hypochlorite System		200	2,000				
	11	Filter Plant Miscellaneous Improvements*					250	250	250
	12	Colonel Ward Valve House Rehabilitation						200	1,000
	13	Colonel Ward Asbestos Abatement	2,200						
	14	Colonel Ward Pumping Optimization				200			
	15	Colonel Ward Power Upgrades	350	1,000	1,000				
	16	Colonel Ward Miscellaneous Improvements*					250	250	250
System Pumping and Storage	17	Massachusetts Ave. Pump One Rehab.				500			
	18	Massachusetts Ave. P.S. Power Upgrades	300	500	8,000	8,000			
	19	Massachusetts Ave. Tunnel Rehab.					500		
	20	Massachusetts Ave. Sump Rehabilitation			100				
	21	Massachusetts Ave. P.S. Miscellaneous Improvements*					250	250	250
	22	Manhattan Tank Rehabilitation						200	2,000
	23	Manhattan Tank & P.S. Misc. Improvements*					250	250	250
	24	Grover Cleveland Tank & P.S. Rehabilitation		200	500	500			
	25	Grover Cleveland Tank & P.S. Misc. Improvements*					100	100	100
	26	Hancock Tank Rehabilitation				200	2,000		
	27	Ferry Tank Rehabilitation					200	2,000	
	28	New System Storage Tank							
	29	System Disinfection Booster Stations					1,000		
	30	Existing Tank Inspection & Evaluation Program	50	50	50				
	31	New Pressure Zone - New Tanks & Pump Station***	250	300	400	4,000	7,000	7,000	
Transmission & Distribution	32	New Pressure Zone - Distribution System Improvements***				500	1,000	4,000	6,000
	33	Annual Watermain / Valve Replacement / Rehabilitation	9,000	9,000	9,000	7,000	7,000	7,000	8,000
Buildings & Other	34	Metering Program	250	250	250	250	250	250	250
	35	System Security	400	200	200	250	250	250	250
	36	Intake Rehabilitation		200	750				500
	37	Miscellaneous Improvements*							
	38	Building Improvements**	300	3,000	2,000	2,000	2,000	1,000	1,000
	Estimated Total Annual Capital Project Costs:		\$14,300	\$22,600	\$25,250	\$24,500	\$22,300	\$23,000	\$20,100
	Notes:								
	* This item includes miscellaneous funds to be used to perform additional upgrades in the treatment, pumping, storage, transmission and other systems as required.								
	** This item includes funds to be used to perform improvements to the buildings including structural beams, walls, floors, windows, roofs and other items as required.								
	*** This item includes initial projected costs for construction of a new pressure zone. Engineering study currently underway that will determine final requirements and costs.								

## PROJECTED SYSTEM WORK

### **Ongoing planned projects/work includes:**

- Leak detection/surveys, unidirectional hydrant flushing and valve exercising programs.
- Continued development of the backflow prevention program.
- Continue scanning of system maps.
- Continue residential meter change-outs and installation of new meters to convert flat to metered accounts.
- Continue to identify and target large meters for change-out to ensure accurate water consumption is recorded.
- Continue to improve employee skills and practices through ongoing training.
- Continue to improve employee health and safety awareness through training.
- Continue programs to pilot and/or incorporate innovative technologies in effort to improve and enhance treatment processes.
- Utilize Trimble® units to gather GPS coordinates for location of assets and system maintenance work.
- Continue to update GIS network with all capital improvements and distribution updates.
- Incorporation of time and attendance software.
- Continue structural evaluation of facility buildings and distribution assets and implement necessary improvements.
- Improvements to the liner of the existing sludge lagoon utilizing either membrane or concrete.
- Further implement Hach Water Information Management Solution (Hach WIMS)<sup>TM</sup> to streamline management of compliance and process related data.
- Continue pilot program for lead service line replacements, as well as residential compliance and surveillance sampling for lead and copper.
- Continue outfitting distribution vehicles with mobile devices that are outfitted with InfoNet Mobile software.
- Continue with implementation of Mobile OPS system for additional locations/personnel.
- Overhaul existing/ antiquated raw water screens with new equipment.
- Replace original coagulant feed and corrosion inhibitor feed systems with new tankage, pumps and SCADA monitoring.
- Replace filter sweeps and associated piping with new material, and top off filters with additional filter media.

# Staffing Summary

## STAFFING SUMMARY

Staffing remained below the 114 employees identified in the Agreement at the end of CY8. As of June 30, 2018 active staff totaled 111 employees, which is three short of the level identified in the Agreement. At the end of CY7 staffing levels stood at 109 employees. The following summary illustrates the positive net change of staffing during the past year:

Administrative Services:	+2
Inspections and Meter Reading:	-1
Repair and Installation of Meters:	+1
Filtration Plant:	+1
Intake:	0
Distribution:	+4
Mechanical Services:	0

Veolia completed another successful year in supplementing Buffalo Water with additional resources to assist them in their primary task of providing safe and reliable water service within the service territory. Veolia, with the approval of the Buffalo Water Board, contracted with several vendors during the year that complimented Buffalo Water's existing workforce. Critical areas where additional labor was contracted out included emergency main break repairs, lead service line replacements, preventative maintenance associated with the chlorine gas system, as well as electrical and mechanical maintenance service contracts. Veolia also continued successful programs from prior years to include the operation of the centrifuge, removal of water plant residuals from the sedimentation basins, repairs at Massachusetts Avenue pumping plant, and various laboratory testing services. Veolia will continue to evaluate areas that will provide additional efficiencies for Buffalo Water in CY9, and to complement the high level of service routinely provided.



<b>Title</b>	<b>Budgeted</b>	<b>Filled (Permanent)</b>	<b>Acting in Another Position</b>	<b>Budgeted Vacancies</b>	<b>Union</b>
<b>Administrative Services</b>					
<b>Account Clerk Typist</b>	12	11	0	1	650
<b>Water Service Adjuster</b>	1	1	0	0	650
<b>Senior Data Processing Equipment Operator</b>	2	2	0	0	650
<b>Teller</b>	2	2	0	0	650
<b>Inspection and Meter Reading</b>					
<b>Water Service Inspector</b>	2	2	0	0	264
<b>Meter Reader</b>	5	5	0	0	264
<b>Repair and Installation of Meters</b>					
<b>Water Meter Mechanic Supervisor I</b>	1	1	0	0	264
<b>Water Meter Mechanic</b>	8	6	0	2	264
<b>Filtration Plant</b>					
<b>Water Treatment Supervisor</b>	1	1	0	0	650
<b>Filtration Plant Maintenance Supervisor I</b>	1	1	0	0	264
<b>Filtration Plant Operator</b>	4	3	0	1	264
<b>Assistant Filtration Plant Operator</b>	4	4	0	0	264
<b>Chemist</b>	2	2	0	0	650
<b>Associate Chemist</b>	1	0	0	1	650

Title	Budgeted	Filled (Permanent)	Acting in Another Position	Budgeted Vacancies	Union
<b>Intake</b>					
Pumping Plant Superintendent	1	1	0	0	17
Chief Pumping Plant Engineer	4	4	0	0	17
Pumping Plant Operator	4	4	0	0	17
Senior 1st Class Stationary Engineer	1	1	0	0	17
Maintenance Assistant (Water)	8	5	0	3	264
Stock Clerk	2	2	0	0	650
Laborer II (Water)	1	1	0	0	264
<b>Distribution</b>					
Water Distribution Superintendent	1	1	0	0	650
Assistant Water Distribution Superintendent	2	2	0	0	650
Caulker Supervisor	6	5	0	1	264T
Caulker*	31	26	1	5	264T
Heavy Equipment Operator (Water)	4	4	0	0	264
Senior Engineer Aide	1	1	0	0	650
Chief Dispatcher	1	0	0	1	650
Dispatcher (Water)	5	4	0	1	264
Water Service Worker	5	2	0	3	264
Account Clerk Typist	2	2	0	0	650
Chief Water Pollution Inspector	1	0	0	1	264
GIS Specialist	1	0	0	1	264

<b>Title</b>	<b>Budgeted</b>	<b>Filled (Permanent)</b>	<b>Acting in Another Position</b>	<b>Budgeted Vacancies</b>	<b>Union</b>
<b>Mechanical Services</b>					
<b>Electrician (Water)</b>	1	1	0	0	264
<b>General Mechanic (Water)</b>	3	3	0	0	264

<b>Total Budgeted Positions:</b>	127
<b>Operating Agreement Positions:</b>	114
<b>Total Positions Filled:</b>	111
<b>Number of Acting Positions:</b>	1
<b>Difference from Agreement:</b>	3

# Occupational Health and Safety Summary

## OCCUPATIONAL HEALTH AND SAFETY

Veolia takes employee safety very seriously and is committed to the health and safety of each worker. Veolia ensures that all employees have access to ample and appropriate training, allowing individuals to perform job duties with a high level of safety and understanding. In addition to biweekly safety handouts, training sessions are scheduled regularly throughout the year.

The following is a summary of training offered to Veolia and City personnel during CY8:

- July 2017
  - Defensive Driving
  - Lock Out Tag Out for Authorized Individuals
- August 2017
  - Dig Safely Certified Excavator Training
- September 2017
  - General Personal Protective Equipment Training
- October 2017
  - Cold Stress and Winter Safety
  - Fall Protection
- December 2017
  - Respiratory Protection Training and Mask Fit Tests
- February 2018
  - Hazardous Communication Training (Hazcom)
- April 2018
  - Confined Space Entry (Refresher)
- May 2018
  - OSHA 10
  - Hazardous Communication Training (Hazcom)

In addition to providing training, Veolia maintains records of near misses and motor vehicle accidents. We continue to strive for service first, safety always, and a goal of zero work place accidents. A report indicating motor vehicle accidents follows.



**MEASURE:** MOTOR VEHICLE INCIDENTS

**DEFINITION:** Motor Vehicle Incident Counts

**TARGET:** Zero

**DATE RANGE:** July-17 to June-18

**CY8 SUMMARY:**

Motor Vehicle Accidents

CY8 Total	14
-----------	----

#### MVA Summary

07/12/2017 - Vehicle W345 was struck by a third party vehicle while driving between W Ferry and Herkimer.  
 07/17/2017 - Vehicle W334 was struck by a third party vehicle at the passenger side while driving on I-90  
 08/04/2017 - Vehicle W218 hit a parked third party vehicle and broke a mirror  
 08/23/2017 - Vehicle W341 was rear ended by third party vehicle  
 10/27/2017 - Vehicle W236 hit third party car when turning onto Northampton and Fillmore Ave  
 12/14/2017 - Vehicle W316 was struck by a third party vehicle  
 01/02/2018 - Vehicle W346 Hit a third party vehicle at Porter Ave-Filter Plant  
 01/05/2018 - Vehicle W349 Was struck by a third party vehicle police report was filed no damage to either vehicle  
 01/16/2018 - Vehicle W351 Was struck by a third party vehicle at Lincoln and Amherst  
 01/18/2018 - Vehicle W349 While parked pick up with plow hit car  
 01/18/2018 - Vehicle W346 Hit a third party vehicle and swiped the side of the car with the plow  
 01/31/2018 - Vehicle W352 Was struck by a third party vehicle  
 02/23/2018 - Vehicle W315 Hit a third party vehicle, police was called and car towed.  
 04/13/2018 - Vehicle W316 Hit a third party vehicle, police was called

#### ANNUAL ACTIVITY

Incident / Injury	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	YTD Total
MVA Non-injury	2	2	0	1	0	1	6	1	0	1	0	0	14
MVA Injury	0	0	0	0	0	0	0	0	0	0	0	0	0
MVA TOTAL	2	2	0	1	0	1	6	1	0	1	0	0	14



# Complaint Summary

## COMPLAINT SUMMARY

Veolia and Buffalo Water continue to work together to address and analyze all customer complaints in a timely, efficient, and tactful manner. We understand that complaints can be uncomfortable, but they also provide direct insight to areas that need attention, maintenance, and service. Customer complaints allow us the opportunity to maintain the integrity of Buffalo Water by the implementation and constant review of our business processes and procedures, and most importantly they give us an opportunity to restore the trust of our constituents. In June 2016, Buffalo Water began taking requests to test for lead in residential drinking water.

The diagram below supplies you with a quick snapshot of the number of customer inquiries registered with the Division of Citizens Services, through the Mayor's 311 Call and Resolution Center. The diagram is broken out by the number of cases and the average time window (in days) from the opening and closing of the case.

	<b>2016 Q3</b>					
	<b>July 2016</b>		<b>August 2016</b>		<b>September 2016</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	15	3.74	27	7.07	29	5
<b>Water Issue</b>	35	3.25	39	5.12	35	3.16
<b>Water Billing/ Meter Issue</b>	12	11.67	7	11.71	14	3.23
<b>Request for Water Testing</b>	2	7.5	28	1.54	21	1.52

	<b>2016 Q4</b>					
	<b>October 2016</b>		<b>November 2016</b>		<b>December 2016</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	20	2.75	9	5.89	12	4.42
<b>Water Issue</b>	18	4.29	20	7.55	16	4.31
<b>Water Billing/ Meter Issue</b>	14	3.38	9	5.14	9	10.23
<b>Request for Water Testing</b>	82	0.80	39	0.42	11	0.68

	<b>2017 Q1</b>					
	<b>January 2017</b>		<b>February 2017</b>		<b>March 2017</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	10	4.60	5	8.00	21	5.38
<b>Water Issue</b>	33	3.76	11	4.36	14	3.57
<b>Water Billing/ Meter Issue</b>	12	5.92	5	2.82	12	4.92
<b>Request for Water Testing</b>	8	0.30	6	0.21	16	9.43

	<b>2017 Q2</b>					
	<b>April 2017</b>		<b>May 2017</b>		<b>June 2017</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	21	7.86	23	3.17	20	3.90
<b>Water Issue</b>	24	5.09	25	4.32	29	5.03
<b>Water Billing/ Meter Issue</b>	18	6.28	17	5.00	13	7.85
<b>Request for Water Testing</b>	11	26.55	16	37.31	16	20.94

	<b>2017 Q3</b>					
	<b>July 2017</b>		<b>August 2017</b>		<b>September 2017</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	19	3.30	13	2.75	19	4.23
<b>Water Issue</b>	11	3.93	26	4.52	28	4.51
<b>Water Billing/ Meter Issue</b>	10	3.83	15	2.42	11	4.31
<b>Request for Water Testing</b>	9	3.28	16	4.98	17	5.62

	<b>2017 Q4</b>					
	<b>October 2017</b>		<b>November 2017</b>		<b>December 2017</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	7	5.20	16	4.70	14	3.49
<b>Water Issue</b>	18	20.29	11	18.74	14	3.29
<b>Water Billing/ Meter Issue</b>	9	5.45	5	3.22	9	5.31
<b>Request for Water Testing</b>	12	13.08	9	5.89	10	13.20

	<b>2018 Q1</b>					
	<b>January 2018</b>		<b>February 2018</b>		<b>March 2018</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	14	5.14	11	4.09	10	3.51
<b>Water Issue</b>	80	3.21	29	3.55	12	9.00
<b>Water Billing/ Meter Issue</b>	8	2.88	5	2.01	10	6.50
<b>Request for Water Testing</b>	13	10.03	4	15.75	6	4.00

	<b>2018 Q2</b>					
	<b>April 2018</b>		<b>May 2018</b>		<b>June 2018</b>	
	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>	<b>Total Cases</b>	<b>Average Duration</b>
<b>Fire Hydrant Issue</b>	9	3.78	15	3.25	10	3.20
<b>Water Issue</b>	31	3.65	32	5.63	35	3.97
<b>Water Billing/ Meter Issue</b>	12	4.10	11	6.36	14	6.29
<b>Request for Water Testing</b>	9	9.69	9	14.67	8	12.16

# Compliance Issues



## Northern Region

### Water Quality Database

City of Buffalo NY

Public Water Supply Permit

PWSID # 1400422

YEAR 2010 - 2011		2010												2011											
Parameter	MCL or Action Level	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Production, MGD		61.19	62.75	60.14	57.86	58.38	58.92	62.43	62.86	57.53	54.30	53.88	56.21	58.84	62.07	62.28	58.68	56.49	58.65	63.01	62.54	58.76	55.36	53.97	56.70
Bacti Report																									
# Performed	150	150	159	182	158	155	151	160	171	161	158	159	163	151	162	152	153	150	162	152	152	151	153	162	154
# Positive Total Coliform		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# Positive Fecal Coliform		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Free Cl2 in Distribution, mg/l	0.2	0.79	0.83	0.88	0.75	0.73	0.72	0.65	0.59	0.64	0.68	0.71	0.74	0.79	0.79	0.82	0.77	0.77	0.73	0.66	0.62	0.61	0.64	0.75	0.77
Average Total Cl2 Leaving Plant, mg/l		1.4	1.4	1.4	1.37	1.36	1.40	1.37	1.41	1.45	1.44	1.45	1.50	1.3	1.3	1.4	1.36	1.36	1.39	1.32	1.33	1.35	1.32	1.32	1.30
Average Raw Water pH, s.u.		8.1	8.0	8.0	8.0	8.0	8.0	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.0	8.0	8.1	8.1	8.0	8.1	8.1	8.0	8.0	8.1	8.0
Average Finished Water pH, s.u.		7.60	7.80	7.80	7.7	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.64	7.65	7.72	7.7	7.7	7.7	7.7	7.8	7.7	7.6	7.6	7.7
Average Fluoride, mg/l		1.00	0.04	0.01	0.87	0.83	0.95	0.75	0.68	0.09	0.06	0.49	0.98	0.87	0.77	0.79	0.77	0.75	0.64	0.66	0.76	0.77	0.78	0.80	0.79
Average e.coli col/100ml raw water		1.00	2.00	0.00	10.00	0.00	3.00	13.75	4.50	1.00	0.00	1.00	2.33	10.00	0.00	2.00	0.00	3.50	4.00	1.00	0.00	10.00	11.00	1.63	2.00
Average crypto oocysts/L raw water		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average Turbidity, n.t.u., Raw Water		15.75	3.21	1.24	3.05	3.13	1.82	0.76	0.85	2.79	2.31	4.76	8.83	4.08	1.21	2.43	8.17	1.84	1.77	0.94	0.79	0.94	9.60	5.11	5.74
Average Turbidity, n.t.u., Finished Water		0.04	0.03	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.04	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Average Turbidity, n.t.u., Distribution System		0.09	0.08	0.1	0.18	0.08	0.09	0.11	0.11	0.10	0.08	0.08	0.08	0.08	0.08	0.0832	0.15	0.17	0.15	0.14	0.16	0.14	0.14	0.12	0.12
Average Free Cl2 Leaving Plant, mg/l		1.09	1.09	1.08	1.07	1.06	1.09	1.07	1.09	1.09	1.08	1.08	1.13	1.06	1.07	1.07	1.05	1.09	1.09	1.07	1.09	1.10	1.08	1.10	1.10
Quarterly	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40		x			x			x			x			x			x					x		
Semi Annual/Annual	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
Inorganic Chemicals																									
Radiologicals					x												x								
Nitrates																									
Arsenic					x												x						x		
Selenium																									
Lead & Copper					x													x							
Principal Organic Contaminants							x												x						
Specific Organic Contaminants					x													x					x		
Principal Inorganic Contaminate					x													x							



## Northern Region

### Water Quality Database

City of Buffalo NY

Public Water Supply Permit

PWSID # 1400422

YEAR 2012 - 2013		2012												2013											
Parameter	MCL or Action Level	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Production, MGD		60.61	62.68	58.10	56.22	57.41	62.39	65.48	68.36	63.77	53.45	49.95	52.57	53.63	59.03	64.91	61.61	62.03	63.76	68.39	68.04	64.66	63.17	63.27	67.88
Bacti Report																									
# Performed	150	157	159	161	150	156	159	152	153	152	150	152	153	153	153	151	161	191	177	216	225	213	250	204	220
# Positive Total Coliform		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
# Positive Fecal Coliform		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Free Cl2 in Distribution, mg/l	0.2	0.85	0.85	0.81	0.82	0.83	0.78	0.68	0.68	0.71	0.67	0.77	0.78	0.78	0.78	0.85	0.81	0.77	0.75	0.66	0.58	0.59	0.64	0.81	0.88
Average Total Cl2 Leaving Plant, mg/l		1.3	1.3	1.3	1.30	1.33	1.37	1.29	1.31	1.38	1.36	1.38	1.35	1.3	1.3	1.3	1.30	1.30	1.30	1.32	1.34	1.35	1.40	1.38	1.32
Average Raw Water pH, s.u.		8.2	8.1	8.2	8.1	8.0	8.0	8.3	8.2	8.3	8.2	8.1	7.9	8.0	8.0	8.0	8.0	8.2	7.9	8.0	8.0	7.9	7.9	7.9	7.9
Average Finished Water pH, s.u.		7.65	7.64	7.67	7.7	7.7	7.6	7.7	7.7	7.6	7.6	7.7	7.6	7.62	7.60	7.60	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.5	7.5
Average Fluoride, mg/l		0.82	0.74	0.72	0.38	0.03	0.56	0.37	0.90	0.89	0.82	0.79	0.84	0.82	0.46	0.73	0.81	0.83	0.88	0.76	0.78	0.78	0.86	0.80	0.72
Average e.coli col/100ml raw water		2.50	1.50	NA	1.63	0.00	0.00	1.00	1.00	0.80	0.43	2.22	1.50	1.14	0.00	1.00	0.92	0.17	0.31	1.75	0.55	0.89	7.73	5.29	19.44
Average crypto oocysts/L raw water		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Average Turbidity, n.t.u., Raw Water		13.79	10.68	8.23	1.97	0.90	1.13	0.60	0.60	0.94	1.67	3.36	3.12	11.53	12.19	5.81	10.98	2.00	1.19	0.98	0.94	0.92	4.93	10.96	11.94
Average Turbidity, n.t.u., Finished Water		0.09	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.10	0.11	0.10	0.10	0.10	0.09	0.09
Average Turbidity, n.t.u., Distribution System		0.17	0.14	0.1576	0.15	0.15	0.14	0.15	0.14	0.16	0.16	0.14	0.15	0.15	0.15	0.15	0.24	0.17	0.18	0.14	0.11	0.12	0.16	0.13	0.18
Average Free Cl2 Leaving Plant, mg/l		1.12	1.11	1.08	1.09	1.12	1.11	1.07	1.08	1.12	1.10	1.12	1.11	1.11	1.09	1.10	1.08	1.08	1.09	1.09	1.09	1.09	1.14	1.15	1.10
Quarterly	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40		x		x			x			x				x			x		x			x		
Semi Annual/Annual	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
Inorganic Chemicals					x						x						x						x		
Radiologicals																	x								
Nitrates					x						x						x						x		
Arsenic					x						x						x						x		
Selenium					x						x														
Lead & Copper																									
Principal Organic Contaminants					x												x								
Specific Organic Contaminants														x											
Principal Inorganic Contaminate					x						x						x								





## Northern Region

### Water Quality Database

City of Buffalo NY

Public Water Supply Permit

PWSID # 1400422

YEAR 2014- 2015

Parameter	MCL or Action Level	2014												2015											
		JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Production, MGD		76.46	83.19	78.82	73.38	70.42	67.50	66.97	70.10	65.34	65.20	66.08	67.95	74.38	75.56	80.98	77.29	73.37	70.51	70.26	70.71	70.21	65.72	66.03	66.73
Bacti Report																									
# Performed	150	226	213	223	230	225	228	238	233	227	248	166	233	185	173	209	199	183	219	210	212	214	195	181	218
# Positive Total Coliform		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# Positive Fecal Coliform		0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Average Free Cl2 in Distribution, mg/l	0.2	0.92	0.91	0.84	0.85	0.74	0.68	0.65	0.70	0.68	0.79	0.88	0.85	0.88	0.85	0.87	0.88	0.84	0.80	0.71	0.69	0.75	0.77	0.85	0.86
Average Total Cl2 Leaving Plant, mg/l		1.32	1.32	1.29	1.30	1.27	1.29	1.31	1.35	1.33	1.36	1.36	1.31	1.3	1.3	1.3	1.29	1.30	1.32	1.30	1.32	1.31	1.32	1.39	1.30
Average Raw Water pH, s.u.		7.9	7.7	8.0	8.2	8.1	8.1	8.0	8.0	8.1	8.0	7.6	7.9	8.0	7.9	7.9	8.1	7.8	8.0	8.1	8.0	8.1	7.8	7.8	8.0
Average Finished Water pH, s.u.		7.49	7.52	7.58	7.8	7.6	7.6	7.7	7.6	7.6	7.6	7.8	7.5	7.50	7.53	7.53	7.7	7.6	7.7	7.8	7.7	7.8	7.6	7.6	7.7
Average Fluoride, mg/l		0.71	0.76	0.80	0.79	0.92	0.94	0.79	0.86	0.85	0.97	0.95	0.88	0.84	0.80	0.79	0.79	0.75	0.77	0.04	0.00	0.00	0.00	0.00	0.00
Average e.coli col/100ml raw water		19.55	7.50	0.00	0.00	1.00	0.53	17.73	8.57	43.33	0.29	1.00	0.25	4.00	0.00	0.00	3.57	1.88	8.33	1.11	20.00	13.53	4.88	5.33	2.11
Average crypto oocysts/L raw water		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NA	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Turbidity, n.t.u., Raw Water		8.19	1.34	0.73	1.16	1.37	0.98	1.71	0.96	1.18	3.79	10.35	6.45	10.54	1.30	0.77	2.02	0.78	0.87	0.82	1.05	0.64	3.36	10.84	3.85
Average Turbidity, n.t.u., Finished Water		0.09	0.11	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.13	0.09	0.09	0.10	0.10	0.08	0.07	0.07	0.09	0.10	0.08	0.08	0.07	0.06	0.06
Average Turbidity, n.t.u., Distribution System		0.14	0.18	0.17	0.13	0.16	0.13	0.10	0.10	0.12	0.12	0.10	0.12	0.14	0.10	0.10	0.10	0.10	0.09	0.11	0.09	0.10	0.08	0.08	0.07
Average Free Cl2 Leaving Plant, mg/l		1.11	1.09	1.08	1.09	1.06	1.07	1.10	1.09	1.10	1.12	1.14	1.11	1.10	1.10	1.09	1.09	1.06	1.08	1.08	1.10	1.07	1.10	1.13	1.09
Quarterly	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40		x			x			x				x		x			x			X			X	
Semi Annual/Annual	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
Inorganic Chemicals												x					x						x		
Radiologicals																	x								
Nitrates												x					x						x		
Arsenic												x					x						x		
Selenium												x													
Lead & Copper							x	x	x	x															
Principal Organic Contaminants																	x								
Specific Organic Contaminants														x											
Principal Inorganic Contaminate																	x								



## Northern Region

### Water Quality Database

City of Buffalo NY

Public Water Supply Permit

PWSID # 1400422

YEAR 2016-2017

YEAR 2016-2017														2017											
Parameter	MCL or Action Level	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Production, MGD		71.98	73.16	72.34	70.74	68.52	71.53	75.29	72.54	69.49	67.58	66.33	69.55	72.31	70.32	72.90	66.74	65.65	66.03	75.29	72.54	69.49	67.58	66.33	61.43
Bacti Report																									
# Performed	150	179	195	212	148	175	201	166	169	180	179	180	180	167	172	197	181	203	193	166	169	180	179	180	165
# Positive Total Coliform		0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
# Positive Fecal Coliform		0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Average Free Cl2 in Distribution, mg/l	<0.2	0.90	0.88	0.87	0.87	0.83	0.85	0.85	0.78	0.79	0.89	0.88	0.89	0.87	0.91	0.95	0.97	0.82	0.76	0.85	0.78	0.79	0.89	0.88	0.95
Average Total Cl2 Leaving Plant, mg/l		1.32	1.30	1.27	1.27	1.31	1.29	1.34	1.31	1.33	1.44	1.41	1.34	1.37	1.42	1.35	1.40	1.32	1.33	1.34	1.31	1.33	1.44	1.41	1.36
Average Raw Water pH, s.u.		8.1	8.1	8.0	8.0	8.0	8.0	8.1	8.3	8.3	8.2	8.1	8.1	8.0	8.0	8.0	8.0	8.0	7.9	8.1	8.3	8.3	8.2	8.1	8.1
Average Finished Water pH, s.u.		7.72	7.66	7.67	7.7	7.7	7.7	7.8	7.8	7.7	7.7	7.7	7.7	7.66	7.65	7.61	7.6	7.7	7.6	7.8	7.8	7.7	7.7	7.7	7.8
Average Fluoride, mg/l		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Average e.coli col/100ml raw water		0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	4.43	0.00	0.00	5.30	2.00	0.00	0.00	3.10	1.00	1.00	0.00	0.00	4.43	0.00	0.00	1
Average crypto oocysts/L raw water		0.00	0.00	0.00	0.00	0.00	0.00	< 0.089	< 0.087	< 0.091	< 0.093	< 0.093	< 0.094	< 0.094	< 0.091	< 0.093	N/A	N/A	N/A	< 0.089	< 0.087	< 0.091	< 0.093	< 0.093	N/A
Average Turbidity, n.t.u., Raw Water		9.40	7.58	4.07	1.84	0.86	0.69	0.66	0.57	0.55	0.60	2.25	7.19	9.47	7.32	5.46	2.55	1.48	1.06	0.66	0.57	0.55	0.60	2.25	7.25
Average Turbidity, n.t.u., Finished Water		0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.10	0.11	0.09	0.09	0.09	0.10	0.10	0.13	0.12	0.11	0.12	0.08	0.10	0.11	0.09	0.09	0.10
Average Turbidity, n.t.u., Distribution System		0.07	0.06	0.06	0.07	0.07	0.09	0.09	0.10	0.13	0.10	0.09	0.09	0.09	0.09	0.11	0.10	0.10	0.13	0.09	0.10	0.13	0.10	0.09	0.11
Average Free Cl2 Leaving Plant, mg/l		1.09	1.09	1.09	1.07	1.09	1.08	1.12	1.08	1.09	1.21	1.13	1.11	1.10	1.16	1.09	1.13	1.09	1.10	1.12	1.08	1.09	1.21	1.13	1.15
Quarterly	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40		x			x			x			x			x			x			x			x	
					x									x	x	x	x	x	x						
Semi Annual/Annual	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
Inorganic Chemicals					x							x					x							x	
Radiologicals																								x	
Nitrates					x							x					x							x	
Arsenic												x					x							x	
Selenium												x					x							x	
Lead & Copper																			x						
Principal Organic Contaminants																									
Specific Organic Contaminants																	x								
Principal Inorganic Contaminate					x												x								

## Northern Region

## Water Quality Database

City of Buffalo NY

Public Water Supply Permit

PWSID # 1400422

YEAR 2018-2019		2018												2019											
Parameter	MCL or Action Level	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Average Monthly Production, MGD		72.48	72.96	69.74	68.92	66.10	68.87																		
Bacti Report																									
# Performed	150	205	168	196	183	191	187																		
# Positive Total Coliform		0	0	0	0	0	0																		
# Positive Fecal Coliform		0.00	0.00	0.00	0	0	0																		
Average Free Cl2 in Distribution, mg/l	<0.2	0.91	0.85	0.81	0.89	0.91	0.92																		
Average Total Cl2 Leaving Plant, mg/l		1.34	1.30	1.28	1.37	1.32	1.42																		
Average Raw Water pH, s.u.		8.1	7.9	8.0	8.0	8.1	8.1																		
Average Finished Water pH, s.u.		7.81	7.62	7.65	7.6	7.6	7.7																		
Average Fluoride, mg/l		0	0.00	0.00	0.00	0.00	0.00																		
Average e.coli col/100ml raw water		0	0.00	0.00	2.60	0.53	0.00																		
Average crypto oocysts/L raw water		N/A	N/A	N/A	N/A	N/A	N/A																		
Average Turbidity, n.t.u., Raw Water		3.97	1.04	0.88	7.18	1.53	0.65																		
Average Turbidity, n.t.u., Finished Water		0.10	0.09	0.11	0.10	0.10	0.13																		
Average Turbidity, n.t.u., Distribution System		0.12	0.12	0.11	0.12	0.12	0.16																		
Average Free Cl2 Leaving Plant, mg/l		1.13	1.09	1.06	1.14	1.08	1.22																		
Quarterly	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
THMs/HAA5 ppb (Stage 2 starts 4/1/12)	80/40		x			x																			
		x	x	x	x	x	x																		
Semi Annual/Annual	LIMITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Parameter	MCL																								
Inorganic Chemicals					x																				
Radiologicals																									
Nitrates					x																				
Arsenic					x																				
Selenium					x																				
Lead & Copper																									
Principal Organic Contaminants																									
Specific Organic Contaminants					x																				
Principal Inorganic Contaminate					x																				

# Customer Satisfaction Survey

## CUSTOMER SATISFACTION SURVEY

Together, Veolia and Buffalo Water will continue to work to provide customers with a high level of customer service and strive for continuous improvement. Results of the Customer Satisfaction Survey conducted during CY8 will be provided upon request. Veolia recommends that a customer satisfaction survey is again conducted during CY9.

# Fleet Summary

## FLEET SUMMARY

### **General Vehicle Contractual Compliance:**

Veolia has provided all documentation in regards to vehicle contractual compliance to the Water Board. Veolia will continue to provide this data ongoing. The Distribution Superintendent and Assistant Distribution Superintendents oversee the fleet for repairs, trades, and new purchases. Our plan is to continue to update the fleet by trading vehicles before they become maintenance burdens. This will ensure a reliable fleet throughout the agreement term.



For the Fiscal Year July 2017 - June 2018, Fleet has an accumulated total of \$ 464,164.20 divided by Fleet and Lease Invoices. These amounts have been broke down by PO (Fleet) and month (Lease.)

1. Fleet



Supplier	PO	Total
WEST HERR FORD OF HANBURG	248886	239.81
RUSINIAKS SERVICE INC	392088	4,845.65
KENWORTH NORTHEAST GROUP INC	393140	2,465.35
FLEET MAINTENANCE INC	393141	8,424.04
KAMINSKI REFRIGERATION AND TRUCK	393655	4,460.28
FREDS WELDING AND MECHANICAL	393771	5,106.08
VALLEY FAB AND EQUIPMENT INC	394998	504.15
FERRY CONCRETE CONSTRUCTION CO INC	396374	3,668.13
FLEETBOS GLOBAL POSITIONING	396428	6,319.50
VALLEY TIRE	396835	16,020.53
NIAGARA FRONTIER EQUIPMENT SALES	402075	6,692.68
C BASIL FORD INC	403424	3,662.34
BL SONS TRUCK REPAIR AND SERVICE	405026	11,291.70
SYRACUSE TRAILER SALES	405703	724.07
HERC RENTALS	406892	2,329.35
C BASIL FORD INC	407026	13,436.00
KAMINSKI REFRIGERATION AND TRUCK	408213	4,900.00
FLEET MAINTENANCE INC	408540	5,068.32
FLYNN TIRES OF PENNSYLVANIA	411452	2,191.63
PROLIFT	413107	2,009.73
C BASIL FORD INC	415083	16,828.00
C BASIL FORD INC	415084	8,414.00
C BASIL FORD INC	415801	27,828.00
BOBCAT OF BUFFALO	418207	3,103.88
BRUTE SPRINT AND EQUIPMENT	420469	4,668.58
THE PEP BOYS OF MANNY MOE AND JACK OF BUFFALO	427680	927.43
REGIONAL INTERNATIONAL CORP	428848	3,773.23
NOCO ENERGY CORP	430527	94.73
C BASIL FORD INC	430574	12,414.00
C BASIL FORD INC	430584	36,742.00
FLEETBOS GLOBAL POSITIONING	438113	6,319.50
REGIONAL INTERNATIONAL CORP	462824	1,059.87
BRENNTAG NORTH AMERICA	463035	701.74
BL SONS TRUCK REPAIR AND SERVICE	465915	9,378.07
SAFELITE FULFILLMENT INC	470534	883.78
C BASIL FORD INC	472225	40,133.00

BOHUNK ENTERPRISES	475556	2,143.50
FLEETBOS GLOBAL POSITIONING	476281	6,319.50
FREDS WELDING AND MECHANICAL	478430	896.00
RUSINIAKS SERVICE INC	478433	3,200.00
CLARK EQUIPMENT COMPANY INC	490367	9,699.00
BOBCAT OF BUFFALO	490372	18,108.15
FREDS WELDING AND MECHANICAL	491191	2,885.12
BOBCAT OF BUFFALO	495474	1,211.15
BL SONS TRUCK REPAIR AND SERVICE	495507	10,062.92
C BASIL FORD INC	499220	4,867.46
C BASIL FORD INC	499459	6,121.61
NIAGARA FRONTIER EQUIPMENT SALES	501480	3,066.41
REGIONAL INTERNATIONAL CORP	510425	6,575.06
VALLEY TIRE	510434	4,743.54
FLEETBOS GLOBAL POSITIONING	513407	6,319.50
RUSINIAKS SERVICE INC	517539	1,160.00
KAMINSKI REFRIGERATION AND TRUCK	522916	1,109.56
KAMINSKI REFRIGERATION AND TRUCK	522917	7,623.00
HERC RENTALS	523005	2,860.23
BL SONS TRUCK REPAIR AND SERVICE	526809	6,148.78
GOODYEAR TIRE AND RUBBER CO MP	543107	755.15
VALLEY TIRE	551652	99.00
CLARK EQUIPMENT COMPANY INC	564184	78,118.76
PCARD PAYMENTS		1,541.65

TOTAL FLEET TY8 SPEND

**\$ 463,264.20**



Created Date	Supplier	Invoice #	Amount	PO
--------------	----------	-----------	--------	----

## Summary - Fleet FY8 - PO 248886



Created Date	Supplier	Invoice #	Amount	PO
12/20/2017	WEST HERR FORD OF HAMBURG	530170	26.62	248886
1/16/2018	WEST HERR FORD OF HAMBURG	532830	50.71	248886
1/16/2018	WEST HERR FORD OF HAMBURG	532830	162.48	248886

**239.81**



## Summary - Fleet FY8 - PO 392088

Created Date	Supplier	Invoice #	Amount	PO
07/17/2017	RUSINIAKS SERVICE INC	152842	320.00	392088
08/08/2017	RUSINIAKS SERVICE INC	1079	254.18	392088
09/01/2017	RUSINIAKS SERVICE INC	515645	500.64	392088
10/11/2017	RUSINIAKS SERVICE INC	154486	280.00	392088
01/22/2018	RUSINIAKS SERVICE INC	325404	994.82	392088
01/22/2018	RUSINIAKS SERVICE INC	7176	637.34	392088
01/22/2018	RUSINIAKS SERVICE INC	7195	1,033.67	392088
02/01/2018	RUSINIAKS SERVICE INC	157255	320.00	392088
02/21/2018	RUSINIAKS SERVICE INC	157837	280.00	392088
04/01/2018	RUSINIAKS SERVICE INC	1335	225.00	392088

**4,845.65**



## Summary - Fleet FY8 - PO 393140



Created Date	Supplier	Invoice #	Amount	PO
07/21/2017	KENWORTH NORTHEAST GROUP INC	B65208	1,141.02	393140
01/17/2018	KENWORTH NORTHEAST GROUP INC	B68343	341.01	393140
03/01/2018	KENWORTH NORTHEAST GROUP INC	B68931	790.19	393140
04/09/2018	KENWORTH NORTHEAST GROUP INC	B69740	193.13	393140

2,465.35



## Summary - Fleet FY8 - PO 393141

Created Date	Supplier	Invoice #	Amount	PO
07/19/2017	FLEET MAINTENANCE INC	81493	697.34	393141
08/01/2017	FLEET MAINTENANCE INC	81501	2,465.81	393141
08/07/2017	FLEET MAINTENANCE INC	81642	855.17	393141
09/01/2017	FLEET MAINTENANCE INC	81715	1,156.16	393141
09/01/2017	FLEET MAINTENANCE INC	81753	3,249.56	393141

8,424.04



## Summary - Fleet FY8 - PO 393655

Created Date	Supplier	Invoice #	Amount	PO
07/21/2017	KAMINSKI REFRIGERATION AND TRUCK	74156	60.00	393655
09/19/2017	KAMINSKI REFRIGERATION AND TRUCK	74502	403.28	393655
10/01/2017	KAMINSKI REFRIGERATION AND TRUCK	74605	29.00	393655
10/11/2017	KAMINSKI REFRIGERATION AND TRUCK	74653	94.85	393655
10/16/2017	KAMINSKI REFRIGERATION AND TRUCK	74712	250.00	393655
10/17/2017	KAMINSKI REFRIGERATION AND TRUCK	74710	75.00	393655
12/14/2017	KAMINSKI REFRIGERATION AND TRUCK	75366	470.00	393655
01/01/2018	KAMINSKI REFRIGERATION AND TRUCK	75838	206.50	393655



01/22/2018	KAMINSKI REFRIGERATION AND TRUCK	76168	940.00	393655
02/01/2018	KAMINSKI REFRIGERATION AND TRUCK	76319	432.90	393655
03/01/2018	KAMINSKI REFRIGERATION AND TRUCK	76304	432.00	393655
03/21/2018	KAMINSKI REFRIGERATION AND TRUCK	76954	54.00	393655
04/18/2018	KAMINSKI REFRIGERATION AND TRUCK	77179	392.00	393655
05/01/2018	KAMINSKI REFRIGERATION AND TRUCK	76929	223.75	393655
06/06/2018	KAMINSKI REFRIGERATION AND TRUCK	77430	372.00	393655
07/17/2018	KAMINSKI REFRIGERATION AND TRUCK	77755	25.00	393655

**4,460.28**



### Summary - Fleet FY8 - PO 393771

Created Date	Supplier	Invoice #	Amount	PO
08/14/2017	FREDS WELDING AND MECHANICAL	799133	2,308.95	393771
11/01/2017	FREDS WELDING AND MECHANICAL	799210	989.13	393771
12/14/2017	FREDS WELDING AND MECHANICAL	799244	282.28	393771
12/21/2017	FREDS WELDING AND MECHANICAL	799257	638.78	393771
01/05/2018	FREDS WELDING AND MECHANICAL	799263	282.28	393771
01/18/2018	FREDS WELDING AND MECHANICAL	799279	241.25	393771
03/01/2018	FREDS WELDING AND MECHANICAL	799304	363.41	393771

**5,106.08**



### Summary - Fleet FY8 - PO 396374

Created Date	Supplier	Invoice #	Amount	PO
08/01/2017	VALLEY FAB AND EQUIPMENT INC	125249	215.25	394998
11/08/2017	VALLEY FAB AND EQUIPMENT INC	125680	119.85	394998
05/07/2018	VALLEY FAB AND EQUIPMENT INC	126810	147.05	394998
05/01/2018	VALLEY FAB AND EQUIPMENT INC	127217	22.00	394998

504.15



## Summary - Fleet FY8 - PO 396374

Created Date	Supplier	Invoice #	Amount	PO
08/01/2017	FERRY CONCRETE CONSTRUCTION CO INC	341860	305.31	396374
10/11/2017	FERRY CONCRETE CONSTRUCTION CO INC	346066	594.83	396374
01/15/2018	FERRY CONCRETE CONSTRUCTION CO INC	351662	83.08	396374
02/01/2018	FERRY CONCRETE CONSTRUCTION CO INC	350485	822.53	396374
03/14/2018	FERRY CONCRETE CONSTRUCTION CO INC	353602	116.74	396374
03/14/2018	FERRY CONCRETE CONSTRUCTION CO INC	351793	111.33	396374
03/15/2018	FERRY CONCRETE CONSTRUCTION CO INC	353808	671.28	396374
04/02/2018	FERRY CONCRETE CONSTRUCTION CO INC	354649	317.10	396374
04/19/2018	FERRY CONCRETE CONSTRUCTION CO INC	355702	27.42	396374
05/15/2018	FERRY CONCRETE CONSTRUCTION CO INC	357114	219.23	396374
06/15/2018	FERRY CONCRETE CONSTRUCTION CO INC	358763	99.95	396374
07/07/2018	FERRY CONCRETE CONSTRUCTION CO INC	360077	222.50	396374
07/07/2018	FERRY CONCRETE CONSTRUCTION CO INC	360157	76.83	396374

3,668.13



## Summary - Fleet FY8 - PO 396428

Created Date	Supplier	Invoice #	Amount	PO
08/01/2017	FLEETBOSS GLOBAL POSITIONING	107379	6,289.50	396428
08/01/2017	FLEETBOSS GLOBAL POSITIONING	107379	30.00	396428

6,319.50



## Summary - Fleet FY8 - PO 402075



Created Date	Supplier	Invoice #	Amount	PO
08/07/2017	VALLEY TIRE	88964654	180.66	396835
08/14/2017	VALLEY TIRE	89631854	357.30	396835
09/06/2017	VALLEY TIRE	89824852	1,012.86	396835
10/03/2017	VALLEY TIRE	93555952	430.00	396835
11/20/2017	VALLEY TIRE	88515754	64.56	396835
12/20/2017	VALLEY TIRE	93666854	483.00	396835
01/01/2018	VALLEY TIRE	92044154	285.11	396835
01/01/2018	VALLEY TIRE	91944354	251.45	396835
01/01/2018	VALLEY TIRE	91831854	77.85	396835
01/01/2018	VALLEY TIRE	91827452	142.66	396835
01/01/2018	VALLEY TIRE	90660854	36.95	396835
01/01/2018	VALLEY TIRE	90564552	946.41	396835
01/01/2018	VALLEY TIRE	90574354	960.00	396835
01/22/2018	VALLEY TIRE	94574554	543.95	396835
02/01/2018	VALLEY TIRE	94477054	124.50	396835
02/19/2018	VALLEY TIRE	92885054	554.64	396835
02/19/2018	VALLEY TIRE	92884254	138.66	396835
02/19/2018	VALLEY TIRE	92406354	244.84	396835
02/19/2018	VALLEY TIRE	92884454	554.64	396835
02/19/2018	VALLEY TIRE	93551552	381.50	396835
02/19/2018	VALLEY TIRE	92888954	135.00	396835
02/19/2018	VALLEY TIRE	92888254	811.80	396835
02/19/2018	VALLEY TIRE	92887354	683.90	396835
02/19/2018	VALLEY TIRE	92886654	391.95	396835
02/19/2018	VALLEY TIRE	92886254	83.85	396835
02/19/2018	VALLEY TIRE	92885954	83.85	396835
02/19/2018	VALLEY TIRE	92884754	554.64	396835
02/19/2018	VALLEY TIRE	92885754	554.64	396835
03/01/2018	VALLEY TIRE	95359054	193.40	396835



03/06/2018	VALLEY TIRE	95429854	141.45	396835
03/07/2018	VALLEY TIRE	95582754	317.30	396835
03/20/2018	VALLEY TIRE	95905454	333.90	396835
04/01/2018	VALLEY TIRE	96023654	1,643.90	396835
04/02/2018	VALLEY TIRE	96178454	212.39	396835
04/11/2018	VALLEY TIRE	93590654	136.66	396835
04/11/2018	VALLEY TIRE	95353654	137.66	396835
04/11/2018	VALLEY TIRE	94147354	161.95	396835
04/11/2018	VALLEY TIRE	93750254	221.46	396835
04/11/2018	VALLEY TIRE	95251152	1,449.29	396835

**16,020.53**



### Summary - Fleet FY8 - PO 402075

Created Date	Supplier	Invoice #	Amount	PO
08/08/2017	NIAGARA FRONTIER EQUIPMENT SALES	P15142	1,101.23	402075
08/08/2017	NIAGARA FRONTIER EQUIPMENT SALES	P15462	395.17	402075
08/15/2017	NIAGARA FRONTIER EQUIPMENT SALES	W02983	1,380.72	402075
11/01/2017	NIAGARA FRONTIER EQUIPMENT SALES	P17641	146.48	402075
12/07/2017	NIAGARA FRONTIER EQUIPMENT SALES	W03588	2,012.62	402075
12/21/2017	NIAGARA FRONTIER EQUIPMENT SALES	W03695	812.05	402075
01/01/2018	NIAGARA FRONTIER EQUIPMENT SALES	P18900	98.66	402075
02/09/2018	NIAGARA FRONTIER EQUIPMENT SALES	P19702	78.21	402075
02/09/2018	NIAGARA FRONTIER EQUIPMENT SALES	W03738	428.96	402075
03/12/2018	NIAGARA FRONTIER EQUIPMENT SALES	P12684	116.19	402075
03/14/2018	NIAGARA FRONTIER EQUIPMENT SALES	P20340	122.39	402075

**6,692.68**



## Summary - Fleet FY8 - PO 403424



Created Date	Supplier	Invoice #	Amount	PO
08/10/2017	C BASIL FORD INC	908750	99.26	403424
10/01/2017	C BASIL FORD INC	909372	1,119.80	403424
11/01/2017	C BASIL FORD INC	909456	594.52	403424
01/01/2018	C BASIL FORD INC	910423	43.95	403424
01/05/2018	C BASIL FORD INC	910422	60.00	403424
02/02/2018	C BASIL FORD INC	597555	40.95	403424
02/07/2018	C BASIL FORD INC	910798	1,390.65	403424
02/09/2018	C BASIL FORD INC	911281	244.99	403424
03/06/2018	C BASIL FORD INC	393580	22.60	403424
03/06/2018	C BASIL FORD INC	393496	45.62	403424

3,662.34



## Summary - Fleet FY8 - PO 405026

Created Date	Supplier	Invoice #	Amount	PO
08/15/2017	BL SONS TRUCK REPAIR AND SERVICE	12818	430.23	405026
08/15/2017	BL SONS TRUCK REPAIR AND SERVICE	12798	541.55	405026
08/15/2017	BL SONS TRUCK REPAIR AND SERVICE	12799	95.93	405026
09/06/2017	BL SONS TRUCK REPAIR AND SERVICE	12838	101.68	405026
09/06/2017	BL SONS TRUCK REPAIR AND SERVICE	12858	121.55	405026
09/06/2017	BL SONS TRUCK REPAIR AND SERVICE	12857	121.60	405026
09/06/2017	BL SONS TRUCK REPAIR AND SERVICE	12848	475.89	405026
09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	12893	85.93	405026
09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	12886	142.68	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12898	156.50	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12889	112.50	405026
09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	94969 AUG17/12864	949.69	405026
09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	12866	85.73	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12890	64.98	405026
09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	16055 AUG17/12884	160.55	405026



09/13/2017	BL SONS TRUCK REPAIR AND SERVICE	750 JUL17/12873	75.00	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12902	464.20	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12913	147.44	405026
09/20/2017	BL SONS TRUCK REPAIR AND SERVICE	12915	488.82	405026
10/23/2017	BL SONS TRUCK REPAIR AND SERVICE	12941	233.91	405026
10/23/2017	BL SONS TRUCK REPAIR AND SERVICE	12954	552.46	405026
10/23/2017	BL SONS TRUCK REPAIR AND SERVICE	12948	94.98	405026
11/06/2017	BL SONS TRUCK REPAIR AND SERVICE	12770	847.91	356386
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	13011	300.00	405026
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	13026	177.40	405026
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	13000	108.28	405026
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	13008	307.22	405026
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	13002	382.85	405026
12/07/2017	BL SONS TRUCK REPAIR AND SERVICE	12993	174.90	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13062	38.98	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13061	97.88	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13059	82.08	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13058	102.72	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13057	162.50	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13049	129.50	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13048	606.50	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13045	518.50	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13038	1,431.08	405026
01/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13034	119.60	405026

11,291.70



### Summary - Fleet FY8 - PO 405703

Created Date	Supplier	Invoice #	Amount	PO
08/17/2017	SYRACUSE TRAILER SALES INC	3272160015	513.90	405703
11/08/2017	SYRACUSE TRAILER SALES INC	3272540007	210.17	405703

724.07



Summary - Fleet FY8 - PO 406892

Created Date	Supplier	Invoice #	Amount	PO
08/18/2017	HERC RENTALS	77370018001	1,127.57	406892
01/01/2018	HERC RENTALS	77819987001	1,201.78	406892
			2,329.35	



Summary - Fleet FY8 - PO 407026

Created Date	Supplier	Invoice #	Amount	PO
08/18/2017	C BASIL FORD INC	84447	6,968.00	407026
08/18/2017	C BASIL FORD INC	83990	6,468.00	407026
			13,436.00	



Summary - Fleet FY8 - PO 408213

Created Date	Supplier	Invoice #	Amount	PO
09/18/2017	KAMINSKI REFRIGERATION AND TRUCK	74557	4,900.00	408213
			4,900.00	



Summary - Fleet FY8 - PO 408540

Created Date	Supplier	Invoice #	Amount	PO
11/08/2017	FLEET MAINTENANCE INC	82609	558.95	408540



11/21/2017	FLEET MAINTENANCE INC	484474	300.30	408540
11/21/2017	FLEET MAINTENANCE INC	485688	26.94	408540
01/18/2018	FLEET MAINTENANCE INC	83523	421.60	408540
11/13/2017	FLEET MAINTENANCE INC	82737	2,521.43	408540
02/01/2018	FLEET MAINTENANCE INC	488556	99.70	408540
05/11/2018	FLEET MAINTENANCE INC	497374	179.78	408540
05/11/2018	FLEET MAINTENANCE INC	498186	115.61	408540
05/11/2018	FLEET MAINTENANCE INC	498730	231.22	408540
05/11/2018	FLEET MAINTENANCE INC	500243	133.58	408540
05/11/2018	FLEET MAINTENANCE INC	497033	93.74	408540
06/06/2018	FLEET MAINTENANCE INC	501763	109.98	408540
06/06/2018	FLEET MAINTENANCE INC	501818	190.92	408540
08/01/2018	FLEET MAINTENANCE INC	504511	84.57	408540

**5,068.32**



### Summary - Fleet FY8 - PO 411452

Created Date	Supplier	Invoice #	Amount	PO
09/01/2017	FLYNN S TIRES OF PENNSYLVANIA INC	38867	182.90	411452
09/01/2017	FLYNN S TIRES OF PENNSYLVANIA INC	38866	201.91	411452
11/13/2017	FLYNN S TIRES OF PENNSYLVANIA INC	39647	334.93	411452
11/13/2017	FLYNN S TIRES OF PENNSYLVANIA INC	39024	383.47	411452
11/13/2017	FLYNN S TIRES OF PENNSYLVANIA INC	39023	178.00	411452
11/20/2017	FLYNN S TIRES OF PENNSYLVANIA INC	38957	107.90	411452
11/20/2017	FLYNN S TIRES OF PENNSYLVANIA INC	39007	73.32	411452
11/20/2017	FLYNN S TIRES OF PENNSYLVANIA INC	39302	301.40	411452
01/05/2018	FLYNN S TIRES OF PENNSYLVANIA INC	40239	322.20	411452
07/17/2018	FLYNN S TIRES OF PENNSYLVANIA INC	41606	105.60	411452

**2,191.63**



### Summary - Fleet FY8 - PO 413107



Created Date	Supplier	Invoice #	Amount	PO
09/06/2017	PROLIFT INC	1S3775770	1,262.03	413107
12/20/2017	PROLIFT INC	1S3846060	137.65	413107
12/20/2017	PROLIFT INC	1S3846070	133.72	413107
02/09/2018	PROLIFT INC	1S3843210	152.00	413107
02/12/2018	PROLIFT INC	1S3881000	324.33	413107

**2,009.73**

### Summary - Fleet FY8 - PO 415083



Created Date	Supplier	Invoice #	Amount	PO
09/13/2017	C BASIL FORD INC	86668	8,414.00	415083
09/13/2017	C BASIL FORD INC	86666	8,414.00	415083

**16,828.00**

### Summary - Fleet FY8 - PO 415084



Created Date	Supplier	Invoice #	Amount	PO
09/13/2017	C BASIL FORD INC	86846	8,414.00	415084

**8,414.00**

### Summary - Fleet FY8 - PO 415801



Created Date	Supplier	Invoice #	Amount	PO
09/13/2017	C BASIL FORD INC	86844	13,914.00	415801
09/13/2017	C BASIL FORD INC	86849	13,914.00	415801

**27,828.00**



### Summary - Fleet FY8 - PO 418207

Created Date	Supplier	Invoice #	Amount	PO
09/14/2017	BOBCAT OF BUFFALO	164287	580.21	418207
12/11/2017	BOBCAT OF BUFFALO	168061	846.74	418207
12/13/2017	BOBCAT OF BUFFALO	168129	380.29	418207
02/09/2018	BOBCAT OF BUFFALO	170139	36.84	418207
02/19/2018	BOBCAT OF BUFFALO	170345	669.82	418207
03/06/2018	BOBCAT OF BUFFALO	171023	589.98	418207

**3,103.88**



### Summary - Fleet FY8 - PO 420469

Created Date	Supplier	Invoice #	Amount	PO
09/20/2017	BRUTE SPRING AND EQUIPMENT INC	40776	631.52	420469
09/20/2017	BRUTE SPRING AND EQUIPMENT INC	40733	1,406.28	420469
12/21/2017	BRUTE SPRING AND EQUIPMENT INC	41346	266.84	420469
03/15/2018	BRUTE SPRING AND EQUIPMENT INC	41661	492.32	420469
04/18/2018	BRUTE SPRING AND EQUIPMENT INC	41034	407.38	420469
04/18/2018	BRUTE SPRING AND EQUIPMENT INC	42020	272.07	420469
04/18/2018	BRUTE SPRING AND EQUIPMENT INC	41712	641.79	420469



07/03/2018

BRUTE SPRING AND EQUIPMENT INC

42541

550.38

420469

4,668.58



### Summary - Fleet FY8 - PO 427680

Created Date	Supplier	Invoice #	Amount	PO
10/01/2017	THE PEP BOYS MANNY MOE AND JACK OF (Inv#3731080841)	3731080842	(85.00)	427680
10/01/2017	THE PEP BOYS MANNY MOE AND JACK OF (Inv#3731081623)	3731081624	(170.00)	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731071024	7.98	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731080841	85.00	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731070359	85.00	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731071695	41.76	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731075335	8.50	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731077303	114.00	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731077304	78.00	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731077553	42.72	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731077555	4.04	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731078076	44.28	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731069807	85.00	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731081878	4.74	427680
10/05/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731081623	194.67	427680
11/01/2017	THE PEP BOYS MANNY MOE AND JACK OF (Inv#3731084324)	3731084354	(110.00)	427680
11/01/2017	THE PEP BOYS MANNY MOE AND JACK OF (Inv#3731082509)	3731084320	(28.49)	427680
11/20/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731084324	110.00	427680
11/20/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731082509	66.48	427680
11/20/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731084357	110.00	427680
12/15/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731085743	104.91	427680
12/15/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731086817	70.00	427680
12/15/2017	THE PEP BOYS MANNY MOE AND JACK OF	3731085737	26.58	427680
01/22/2018	THE PEP BOYS MANNY MOE AND JACK OF	3731088128	4.04	427680
01/22/2018	THE PEP BOYS MANNY MOE AND JACK OF	3731088103	33.22	427680

927.43

### Summary - Fleet FY8 - PO 428848



Created Date	Supplier	Invoice #	Amount	PO
10/16/2017	REGIONAL INTERNATIONAL CORP	33103311P	373.34	428848
10/17/2017	REGIONAL INTERNATIONAL CORP	3352895	3,399.89	428848

3,773.23

### Summary - Fleet FY8 - PO 430527



Created Date	Supplier	Invoice #	Amount	PO
11/08/2017	NOCO ENERGY CORP	6013818	94.73	430527

94.73

### Summary - Fleet FY8 - PO 430574



Created Date	Supplier	Invoice #	Amount	PO
10/16/2017	C BASIL FORD INC	85392	12,414.00	430574

12,414.00



### Summary - Fleet FY8 - PO 430584

Created Date	Supplier	Invoice #	Amount	PO
10/16/2017	C BASIL FORD INC	85391	11,414.00	430584
10/16/2017	C BASIL FORD INC	85325	11,414.00	430584
10/16/2017	C BASIL FORD INC	85323	13,914.00	430584
			<b>36,742.00</b>	



### Summary - Fleet FY8 - PO 438113

Created Date	Supplier	Invoice #	Amount	PO
11/01/2017	FLEETBOSS GLOBAL POSITIONING	108953	30.00	438113
11/01/2017	FLEETBOSS GLOBAL POSITIONING	108953	6,289.50	438113
			<b>6,319.50</b>	



### Summary - Fleet FY8 - PO 462824

Created Date	Supplier	Invoice #	Amount	PO
02/09/2018	REGIONAL INTERNATIONAL CORP	3354177	419.08	462824
08/01/2018	REGIONAL INTERNATIONAL CORP	33125479P	294.14	462824
12/21/2017	REGIONAL INTERNATIONAL CORP	3310897P	346.65	462824
			<b>1,059.87</b>	



### Summary - Fleet FY8 - PO 463035



Created Date	Supplier	Invoice #	Amount	PO
12/21/2017	BRENTAG NORTH AMERICA INC	6066269	82.50	463035
01/01/2018	BRENTAG NORTH AMERICA INC	6068368	240.35	463035
02/12/2018	BRENTAG NORTH AMERICA INC	6089837	196.09	463035
06/06/2018	BRENTAG NORTH AMERICA INC	6181737	182.80	463035

701.74



### Summary - Fleet FY8 - PO 465915

Created Date	Supplier	Invoice #	Amount	PO
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13086	415.60	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13070	336.72	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13080	189.95	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13052	328.87	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13091	285.00	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13069	1,618.83	465915
01/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13067	1,619.61	465915
02/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13099	236.67	465915
02/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13094	236.67	465915
02/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13107	254.23	465915
02/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13104	499.52	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13103	1,034.00	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13152	80.00	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13125	83.69	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13147	396.34	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13151	1,049.53	465915
03/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13128	596.84	465915
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13172	116.00	465915

9,378.07



### Summary - Fleet FY8 - PO 470534

Created Date	Supplier	Invoice #	Amount	PO
01/15/2018	SAFELITE FULFILLMENT INC	1865284740	381.89	470534
01/18/2018	SAFELITE FULFILLMENT INC	1865285697	301.89	470534
04/11/2018	SAFELITE FULFILLMENT INC	1450024986	200.00	470534

883.78



### Summary - Fleet FY8 - PO 472225

Created Date	Supplier	Invoice #	Amount	PO
02/09/2018	C BASIL FORD INC	86136	40,133.00	472225

40,133.00



### Summary - Fleet FY8 - PO 475556

Created Date	Supplier	Invoice #	Amount	PO
01/23/2018	BOHUNK ENTERPRISES LLC	122717386	562.50	475556
01/23/2018	BOHUNK ENTERPRISES LLC	102617313	855.00	475556
02/21/2018	BOHUNK ENTERPRISES LLC	2031807	726.00	475556

2,143.50



### Summary - Fleet FY8 - PO 476281

Created Date	Supplier	Invoice #	Amount	PO
01/24/2018	FLEETBOSS GLOBAL POSITIONING	110779	6,289.50	476281

01/24/2018

FLEETBOSS GLOBAL POSITIONING

110779 30.00 476281

6,319.50

### Summary - Fleet FY8 - PO 478430



Created Date	Supplier	Invoice #	Amount	PO
02/12/2018	FREDS WELDING AND MECHANICAL	799285	896.00	478430

896.00

### Summary - Fleet FY8 - PO 478433



Created Date	Supplier	Invoice #	Amount	PO
02/05/2018	RUSINIAKS SERVICE INC	1266	3,200.00	478433

3,200.00

### Summary - Fleet FY8 - PO 490367



Created Date	Supplier	Invoice #	Amount	PO
07/17/2018	CLARK EQUIPMENT COMPANY INC	978022	9,699.00	490367

9,699.00

### Summary - Fleet FY8 - PO 490372



Created Date	Supplier	Invoice #	Amount	PO
--------------	----------	-----------	--------	----



08/20/2018 BOBCAT OF BUFFALO 180460 18,108.15 490372

18,108.15

Summary - Fleet FY8 - PO 491191



Created Date	Supplier	Invoice #	Amount	PO
03/01/2018	FREDS WELDING AND MECHANICAL	799302	213.00	491191
03/01/2018	FREDS WELDING AND MECHANICAL	799317	389.50	491191
03/02/2018	FREDS WELDING AND MECHANICAL	799296	309.43	491191
03/02/2018	FREDS WELDING AND MECHANICAL	799284	730.00	491191
03/19/2018	FREDS WELDING AND MECHANICAL	799312	276.20	491191
06/06/2018	FREDS WELDING AND MECHANICAL	799416	170.33	491191
07/01/2018	FREDS WELDING AND MECHANICAL	799433	514.38	491191
07/24/2018	FREDS WELDING AND MECHANICAL	799273	282.28	491191

2,885.12



Summary - Fleet FY8 - PO 495474

Created Date	Supplier	Invoice #	Amount	PO
06/11/2018	BOBCAT OF BUFFALO	174686	1,211.15	495474

1,211.15



Summary - Fleet FY8 - PO 495507

Created Date	Supplier	Invoice #	Amount	PO
--------------	----------	-----------	--------	----

03/07/2018	BL SONS TRUCK REPAIR AND SERVICE	13155	327.50	495507
03/07/2018	BL SONS TRUCK REPAIR AND SERVICE	13144	624.36	495507
03/12/2018	BL SONS TRUCK REPAIR AND SERVICE	13153	1,042.82	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13141	40.00	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13215	96.91	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13214	304.13	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13213	21.00	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13203	93.40	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13201	470.75	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13199	120.00	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13193	257.92	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13190	771.75	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13187	618.18	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13186	254.15	495507
04/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13248	332.60	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13244	78.66	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13246	332.58	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13243	618.07	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13241	120.56	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13208	287.20	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13209	40.00	495507
04/18/2018	BL SONS TRUCK REPAIR AND SERVICE	13221	104.51	495507
05/15/2018	BL SONS TRUCK REPAIR AND SERVICE	13238	68.25	495507
05/22/2018	BL SONS TRUCK REPAIR AND SERVICE	13253	80.00	495507
05/22/2018	BL SONS TRUCK REPAIR AND SERVICE	13290	1,181.57	495507
05/22/2018	BL SONS TRUCK REPAIR AND SERVICE	13282	160.00	495507
05/22/2018	BL SONS TRUCK REPAIR AND SERVICE	13277	1,527.22	495507
05/23/2018	BL SONS TRUCK REPAIR AND SERVICE	13289	88.83	495507

10,062.92
-----------



## Summary - Fleet FY8 - PO 499220



Created Date	Supplier	Invoice #	Amount	PO
05/01/2018	C BASIL FORD INC	605130	1,605.15	499220
05/17/2018	C BASIL FORD INC	911716	497.52	499220
06/06/2018	C BASIL FORD INC	912028	39.95	499220
07/01/2018	C BASIL FORD INC	912183	2,546.36	499220
08/17/2018	C BASIL FORD INC	912589	178.48	499220

**4,867.46**



## Summary - Fleet FY8 - PO 499459

Created Date	Supplier	Invoice #	Amount	PO
04/19/2018	C BASIL FORD INC	598976	4,986.26	499459
04/20/2018	C BASIL FORD INC	600748	1,135.35	499459

**6,121.61**



## Summary - Fleet FY8 - PO 501480

Created Date	Supplier	Invoice #	Amount	PO
03/21/2018	NIAGARA FRONTIER EQUIPMENT SALES	P20484	444.82	501480
05/07/2018	NIAGARA FRONTIER EQUIPMENT SALES	W04132	753.35	501480
05/22/2018	NIAGARA FRONTIER EQUIPMENT SALES	W04297	948.81	501480
05/22/2018	NIAGARA FRONTIER EQUIPMENT SALES	W04298	919.43	501480

**3,066.41**



## Summary - Fleet FY8 - PO 510425



Created Date	Supplier	Invoice #	Amount	PO
05/15/2018	REGIONAL INTERNATIONAL CORP	3354674	6,575.06	510425

**6,575.06**

## Summary - Fleet FY8 - PO 510434



Created Date	Supplier	Invoice #	Amount	PO
05/01/2018	VALLEY TIRE	96956054	315.77	510434
05/01/2018	VALLEY TIRE	96956954	127.20	510434
05/01/2018	VALLEY TIRE	97004654	319.72	510434
05/01/2018	VALLEY TIRE	96582653	2,252.00	510434
05/07/2018	VALLEY TIRE	96957354	56.50	510434
06/06/2018	VALLEY TIRE	97389752	1,083.74	510434
06/06/2018	VALLEY TIRE	97708554	253.61	510434
07/24/2018	VALLEY TIRE	97965653	335.00	510434

**4,743.54**

## Summary - Fleet FY8 - PO 513407



Created Date	Supplier	Invoice #	Amount	PO
04/19/2018	FLEETBOSS GLOBAL POSITIONING	112584	6,289.50	513407
04/19/2018	FLEETBOSS GLOBAL POSITIONING	112584	30.00	513407

**6,319.50**



### Summary - Fleet FY8 - PO 517539

Created Date	Supplier	Invoice #	Amount	PO
05/01/2018	RUSINIAKS SERVICE INC	157477	360.00	517539
07/17/2018	RUSINIAKS SERVICE INC	1389	800.00	517539
			<b>1,160.00</b>	



### Summary - Fleet FY8 - PO 522916

Created Date	Supplier	Invoice #	Amount	PO
06/06/2018	KAMINSKI REFRIGERATION AND TRUCK	77396	1,109.56	522916
			<b>1,109.56</b>	



### Summary - Fleet FY8 - PO 522917

Created Date	Supplier	Invoice #	Amount	PO
06/06/2018	KAMINSKI REFRIGERATION AND TRUCK	77357	7,623.00	522917
			<b>7,623.00</b>	



### Summary - Fleet FY8 - PO 523005

Created Date	Supplier	Invoice #	Amount	PO
05/15/2018	HERC RENTALS INC	78286593001	1,612.44	523005
06/21/2018	HERC RENTALS INC	29200263001	999.64	523005
07/17/2018	HERC RENTALS INC	30114998001	248.15	523005



2,860.23



### Summary - Fleet FY8 - PO 526809

Created Date	Supplier	Invoice #	Amount	PO
05/22/2018	BL SONS TRUCK REPAIR AND SERVICE	13301	88.83	526809
05/23/2018	BL SONS TRUCK REPAIR AND SERVICE	13304	662.92	526809
06/06/2018	BL SONS TRUCK REPAIR AND SERVICE	7596	21.00	526809
06/06/2018	BL SONS TRUCK REPAIR AND SERVICE	7609	10.00	526809
06/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13306	109.50	526809
06/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13300	2,272.27	526809
06/06/2018	BL SONS TRUCK REPAIR AND SERVICE	13309	1,596.70	526809
07/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13336	86.08	526809
07/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13346	159.95	526809
07/01/2018	BL SONS TRUCK REPAIR AND SERVICE	13341	155.73	526809
08/01/2018	BL SONS TRUCK REPAIR AND SERVICE	11348	985.80	526809

6,148.78



### Summary - Fleet FY8 - PO 543107

Created Date	Supplier	Invoice #	Amount	PO
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169914	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169919	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169972	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169907	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169914	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169950	49.95	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	170195	113.75	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	169979	55.20	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	170050	60.45	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	170092	60.45	543107



07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	170034	55.20	543107
07/15/2018	GOODYEAR TIRE AND RUBBER CO MP	170067	60.45	543107
07/19/2018	GOODYEAR TIRE AND RUBBER CO MP	169934	49.95	543107

755.15
--------



### Summary - Fleet FY8 - PO 551652

Created Date	Supplier	Invoice #	Amount	PO
08/22/2018	VALLEY TIRE	97625052	99.00	551652

99.00
-------



### Summary - Fleet FY8 - PO 564184

Created Date	Supplier	Invoice #	Amount	PO
08/24/2018	CLARK EQUIPMENT COMPANY INC	1026269	78,118.76	564184

78,118.76
-----------



### Summary - Fleet FY8 - Pcard Pmts

Created Date	Supplier	Invoice #	Amount	PO
11/09/2017	PEPBOYS STORE 373	3731083407	28.48	PCARD TE146293
12/11/2017	PEPBOYS STORE 373	3731077043	116.60	PCARD TE151439
01/08/2018	FREDS WELDING AND MECH	799132	319.72	PCARD TE156244
01/08/2018	VALLEYTIRE COMPANY 54	88515754	64.56	PCARD TE156244

02/01/2018	CASULLO S TRUCK AND AUTO	175190	225.00	PCARD TE157313
03/12/2018	HERTZ EQUIPMENT	77921634001	203.30	PCARD TE166474
		3731095104/373108		
		9856/3731087463/3		
07/06/2018	PEPBOYS STORE 373	731095405	322.07	PCARD TE187386
		3731099609/373110		
8/31/2018	PEPBOYS STORE 373	0491/3731099602	261.92	PCARD TE197868

1,541.65
----------

463,264.20
------------

### Summary- LEASE FY8- JULY



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B15282	07/31/2017	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B15282	07/31/2017	1FVACYBS8CHBM8774	60
2G80	102074	25	25	B15282	07/31/2017	1FVACXDT9CHBM8766	60
			75				

### Summary- LEASE FY8- AUGUST



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	1486.26	25	B26238	08/31/2017	1FVACYBS6CHBM8773	60
2G80	102015	1743.83	25	B26238	08/31/2017	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B26238	08/31/2017	1FVACXDT9CHBM8766	60
			75				

### Summary- LEASE FY8- SEPTEMBER



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	1486.26	25	B37196	09/30/2017	1FVACYBS6CHBM8773	60
2G80	102015	1743.83	25	B37196	09/30/2017	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B37196	09/30/2017	1FVACXDT9CHBM8766	60
			75				

### Summary- LEASE FY8- OCTOBER



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
--------	---------	---------------	---------------------	----------------	-------------	-----	------------



2G80 102014	1468.97	25 B48180	10/31/2017	1FVACYBS6CHBM8773	60
2G80 102015	1724.02	25 B48180	10/31/2017	1FVACYBS8CHBM8774	60
2G80 102074	2208.01	25 B48180	10/31/2017	1FVACXDT9CHBM8766	60
		75			



### Summary- LEASE FY8- NOVEMBER

Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B59097	11/30/2017	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B59097	11/30/2017	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B59097	11/30/2017	1FVACXDT9CHBM8766	60
			75				



### Summary- LEASE FY8- DECEMBER

Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B70009	12/31/2017	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B70009	12/31/2017	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B70009	12/31/2017	1FVACXDT9CHBM8766	60
			75				



### Summary- LEASE FY8- JANUARY

Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B80761	01/31/2018	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B80761	01/31/2018	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B80761	01/31/2018	1FVACXDT9CHBM8766	60
			75				

## Summary- LEASE FY8- FEBRUARY



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B91628	02/28/2018	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B91628	02/28/2018	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B91628	02/28/2018	1FVACXDT9CHBM8766	60
			75				

## Summary- LEASE FY8- MARCH



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B02454	03/31/2018	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B02454	03/31/2018	1FVACYBS8CHBM8774	60
2G80	102074	2208.01	25	B02454	03/31/2018	1FVACXDT9CHBM8766	60
			75				

## Summary- LEASE FY8- APRIL



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B13216	04/30/2018	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B13216	04/30/2018	1FVACYBS8CHBM8774	60
2G80	102074	2182.52	25	B13216	04/30/2018	1FVACXDT9CHBM8766	60
			75				

## Summary- LEASE FY8- MAY



Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
--------	---------	---------------	---------------------	----------------	-------------	-----	------------



2G80 102014	25	25	B19429	05/31/2018	1FVACYBS6CHBM8773	60
2G80 102015	25	25	B19429	05/31/2018	1FVACYBS8CHBM8774	60
2G80 102074	25	25	B19429	05/31/2018	1FVACXDT9CHBM8766	60
			75			



### Summary- LEASE FY8- JUNE

Client	Vehicle	Rental Amount	Total Amount Billed	Invoice Number	Invoice Due	VIN	Lease Term
2G80	102014	25	25	B30113	06/21/2018	1FVACYBS6CHBM8773	60
2G80	102015	25	25	B30113	06/21/2018	1FVACYBS8CHBM8774	60
2G80	102074	25	25	B30113	06/21/2018	1FVACXDT9CHBM8766	60
			75				

Lease Ending Total

900



# CY8 - Current Vehicle List

Vehicle#	Year	Make	Model	Vehicle Identification #	Plate #	Location	Tire Size	NYSI	Cond.	Fuel
W-131	1988	INTERNATIONAL	F1954 FLATBED	1HTLKTVR6JH585866	L49664	S.C.	11.00RX22.5	Oct-08	POOR	D
W-135	1988	HAULE TRAILER	TRAILER	16Y80H426JMS08804	L49666	WARD	P7814S	May-09	POOR	
W-148	1993	INGERSOL RAND	COMPRESSOR P185WJD	237988UHD328	L49667	S.C.	215X75R15		GOOD	D
W-154	1993	MITSUBISHI	FG30 TOWMTR	AF13030098		S.C.	28.9-15NN 6.50-10NNS		GOOD	G
W-180	1998	INTERNATIONAL	REPAIR TRUCK	1HTSDAANXWH506770	K12277	S.C.				
W-199	1999	CAM UTIL TRAILR	UTILITY TRAILER	4YUUF202XXJ002238	L49693	S.C.	LT235/85RX16	Dec-08	GOOD	
W-207	2002	CHEVY	MD60 11' SERVICE	1GBK6H1C72J507896	K34956	S.C.	245/75RX22.5	Feb-09	GOOD	D,U
W-211	2005	INTERNATIONAL	7300 10 TON DUMP	1HTWAAAR95J036395	R17842	S.C.	12.00RX22.5	Apr-09	GOOD	D
W-212	2005	INTERNATIONAL	7300 10 TON DUMP	1HTWAAAR05J036396	R17807	S.C.	12.00RX22.5	Apr-09	GOOD	D
W-218	2004	GMC / ISUZU	FLATBED	4KLB4B1U64J801638	L82761	S.C.		Aug-09	GOOD	G,D*
W-227	2006	INTERNATIONAL	4200 FLATBED CRANE	1HTMPAFL56H244244	L87360	S.C.	11.00RX22.5	Aug-08	GOOD	D
W-228	2006	INTERNATIONAL	7300 10 TON DUMP	1HTWAAAR26J328312	L87377	S.C.	12.00RX22.5	Jan-09	GOOD	D
S-512-W	1996	JOHN DEERE	LOADER	DW544GD558835	L49626	S.C.	17.5X25		GOOD	D
PURCHASED 2009-2010 (American Water)										
W-240	2009	FORD 4X4	F-350 9' SERVICE BODY	1FDWF37YX9EA37235	M51808	S.C.	LT245X75R17 DRW	Feb-09	GOOD	G
W-241	2009	FORD 4X4	F-350 9' SERVICE BODY	1FDWF37Y19EA37236	M51809	S.C.	LT245X75R17 DRW	Feb-09	GOOD	G
W-255	2009	FREIGHTLINER	REPAIR TRUCK	1FVACXDT5ADAP6310	M61793	S.C.	11R22.5 DRW	Nov-09	GOOD	D,U
W-256	2009	FREIGHTLINER	REPAIR TRUCK	1FVACXDT7ADAP6311	M61794	S.C.	11R22.5 DRW	Nov-09	GOOD	D,U
W-257	2009	FREIGHTLINER	REPAIR TRUCK	1FVACXDT9ADAP6321	M61792	S.C.	11R22.R DRW	Nov-09	GOOD	D,U
PURCHASED 2010-2011 (Veolia Water)										
W-258	2010	SCAG	61" ZERO TURN MOWER	E5401449		WARD				
W-259	2010	SCAG	61" ZERO TURN MOWER	E85401450		WARD				
W-260	2011	BRIMAR	LAWN TRAILER	43YDC222XBC083082	M74315	WARD				
W-261	2010	INGERSOLL RAND	AIR COMPRESSOR	4FVCABDA6BU420420	R17810	S.C.				
W-262	2010	INGERSOLL RAND	AIR COMPRESSOR	4FVCABDA8BU420421	R17814	S.C.				
W-263	2010	INGERSOLL RAND	AIR COMPRESSOR	4FRVCABDAXBU420422	R17811	S.C.				
W-264	2010	INGERSOLL RAND	AIR COMPRESSOR	4FVCABDA1BU420423	R17812	S.C.				
W-265	2010	INGERSOLL RAND	AIR COMPRESSOR	4FVCABDA3BU420424	R17813	S.C.				
PURCHASED 2011-2012 (Veolia Water)										
W-279	2012	FORD 4X4	F-350 1 TON DUMP	1FDRF3H68CEA41706	R21605	S.C.	LT245X75R17 DRW			
W-280	2012	FORD 4X4	F-350 1 TON DUMP	1FDRF3H6XCEA41707	R21610	S.C.	LT245X75R17 DRW			

W-281	2012	FORD 4X4	F-350 NON PAY/ VAC	1FDRF3H61CEA41708	R21604	S.C.	LT245X75R17 DRW			
W-282	2012	FORD 4X4	F-350 UTILITY / COMP TRUCK	1FDRF3H63CEA41709	R21603	S.C.	LT245X75R17 DRW			
W-283	2012	FORD 4X4	F-350 UTILITY / COMP TRUCK	1FDRF3H6XCEA41710	R21606	S.C.	LT245X75R17 DRW			
W-284	2012	FORD 4X4	F-350 UTILITY / COMP TRUCK	1FDRF3H61CEA41711	R21607	S.C.	LT245X75R17 DRW			
W-285	2012	FORD 4X4	F-350 UTILITY / SERVICE TRUCK	1FDRF3H63CEA41712	R21608	S.C.	LT245X75R17 DRW			
W-286	2012	FORD 4X4 ext cab	F-350 UTILITY / SERVICE TRUCK	1FD8X3H69CEA33316	R21609	S.C.	LT245X75R17 DRW			
W-287	2012	FREIGHTLINER	12' DUMP	1FVACYBS6CHBM8773	R21611	S.C.	11R22.5 DRW			
W-288	2012	FREIGHTLINER	12' DUMP	1FVACYBS8CHBM8774	R21612	S.C.	11R22.5 DRW			
W-289	2011	NEW HOLLAND	BACK HOE	FNH0B95BNBHH04076	R21675	S.C.	16.9x28			
W-293	2011	CLARK	TOW MOTOR	CQ230L-148-9841		S.C.				
W-296	2012	FREIGHTLINER	REPAIR TRUCK	1FVACXDT9CHBM8766	R26555	S.C.	11R22.R DRW			
W-297	2013	MAGNUM	LIGHT TOWER / GENERATOR	5AJLS1417CB210989	R31773	S.C.				
PURCHASED 2012-2013 (Veolia Water)										
W-298	2012	FORD 4X4	F-350 NON PAY/ VAC	1FDRF3H64CEC86017	R33922	S.C.	LT245X75R17 DRW			
PURCHASED 2013-2014 (Veolia Water)										
W-312	2014	FORD 4X4	F-350 NON PAY/ VAC	1FDRF37Y89EB25684	R39898		LT245X75R17 DRW	Sep-14		
W-313	2014	FORD 4X4	F-350 DUMP	1FDWF37Y89EA37234	R39896		LT245X75R17 DRW	Sep-14		
W-314	2014	FORD 4X4	F-350 DUMP	1FDRF3H61EEA26953	R39897		LT245X75R17 DRW	Sep-14		
W-315	2014	FORD 4X4	F-350 SERVICE TRUCK	1FD8X3H66EEA29956	R39895		LT245X75R17 DRW	Sep-14		
PURCHASED 2014-2015 (Veolia Water)										
W-317	2014	FORD 4X4	F-150 EXT CAB PICK UP	1FTFX1EF6EKF88992	AV2424					
W-318	2015	HYSTER	TOW MOTOR	K160N04765N						
PURCHASED 2015-2016 (Veolia Water)										
W-319	2015	CHEVY	2500 CARGO VAN	1GCWGFCF7F1276056	AW6946	WARD				
W-320	2015	CHEVY	2500 CARGO VAN	1GCWGFCF9F1276916	AW6944	WARD				
W-322	2016	CAM	20FT TRAILER	5JPBU2526GP041775	AW9460	DIST				
W-323	2016	BOBCAT	S-450 SKID STEER	D18NAP5002969L00		DIST				
W-324	2016	BOBCAT	S-550 SKID STEER	AHGM1215510132015		WARD				
W-325	2016	CAM	16FT TRAILER	5JPBU2028GP042367	A62850	WARD				
W-326	2016	FORD 4X4	F-250 PICKUP	1FTBF2B67GEB54934	AX3668	DIST				
PUCHASED 2016-2017 (Veolia Water)										
W-327	2016	FORD 4X4	F-250 PICKUP	1FTBF2B66GEB92493	AX4756					
W-328	2016	KENWORTH	TANDEM DUMP	2NKHLJ0X7HM142260	AX9697					

W-329	2016	WACHS	VALVE TURNER TRAILER	1E9PT1517GC297144	AY2188					
W-330	2009	Atlas Comp	AIR COMPRESSOR	4500A1012CR039738	AZ1619					
W-332	2017	FORD 4X4	F-150 EXT CAB / Martin	1FTFX1EF8HFC38034	AJ6392					
W-333	2017	FORD 4X4	F-150 EXT CAB / Kruez	1FTFX1EF8HFC38035	AJ6393					
W-334	2017	FORD 4X4	F-150 EXT CAB / McManus	1FTFX1EF8HFC38036	AJ6389					
W-335	2017	FORD 4X4	F-150 EXT CAB / Abbate	1FTFX1EF4HFC38032	AJ6391					
W-336	2017	FORD 4X4	F-150 EXT CAB / Hapke	1FTFX1EF4HFC38033	AJ6390					
W-337	2017	FORD / AWD	ESCAPE / BUTCH	1FMCU9GD8HUE17512	AJ6134					
W-338	2017	FORD / AWD	ESCAPE / DAVIS	1FMCU9GD8HUE17513	AJ6129					
W-339	2017	FORD / AWD	ESCAPE / REDFERN	1FMCU9GD8HUE17514	AJ6133					
W-340	2017	FORD / AWD	ESCAPE / PANCZYK	1FMCU9GD8HUE17515	AJ6132					
W-341	2017	FORD 4X4	F-250 / GARTZ	1FTBF2B69HED87392	AJ6051					
W-342	2017	FORD 4X4	F-250 PICK UP	1FTBF2B69HED87394	AJ6081					
W-343	2017	FORD 4X4	F-250 PICK UP	1FTBF2B69HED87395	AJ6127					
W-344	2017	FORD 4X4	F-250 PICK UP	1FTBF2B69HED87393	AV1021					
W-345	2017	FORD 4X4	F-250 PICK UP	1FTBF2B69HED87396	AJ6137					
W-346	2017	FORD 4X4	F-250 PLOW TRUCK	1FTBF2B69HED87391	AJ6128					
W-347	2017	FORD / AWD	ESCAPE	1FMCU9GD4HUE24828	AJ6135					
W-348	2017	FORD / AWD	ESCAPE	1FMCU9GD4HUE24827	AJ6136					
W-349	2017	FORD	TRANSIT 250	1FTYR1YM4HKB32040	AJ6131					
W-350	2017	FORD	TRANSIT 250	1FTYR1YM4HKB32041	AJ6103					
W-351	2017	FORD	TRANSIT 250	1FTYR1YM4HKB32042	AJ6130					
W-352	2017	FORD	TRANSIT 250	1FTYR1YM0HKB35260	AJ6388					
W-353	2017	FORD	TRANSIT 250	1FTYR1YM0HKB35261	AJ6387					
W-354	2017	FORD	TRANSIT 250	1FTYR1YM4HKB35259	AJ6385					
W-355	2017	FORD	TRANSIT 250	1FTYR1YM4HKB35260	AJ6394					
W-356	2017	FORD	TRANSIT 250	1FTYR1YM4HKB35258	AJ6384					
W-357	2017	FORD	TRANSIT 250	1FTYR1YM4HKB32039	AV1019					
PUCHASED 2017-2018 (Veolia Water)										
W-358	2018	FORD	F-350 UTILITY / SEVICE TRK	1FD8X3B64HEE51508	BA1962					
PUCHASED 2018-2019 (Veolia Water)										
W-359	2018	BOBCAT	E42 MINI EXCAVATOR	D24NAP8134128LEE01		DIST			NEW	
W-360	2018	BOBCAT	E85 MINI EXCAVATOR	D24NAP8129754LEE05		DIST	TRACK	Aug-18	NEW	
W-361	2018	TRAILER KING	24' TRAILER	5JWCK3324JP066480	AB8756	DIST			NEW	
W-362	2019	PETERBILT		2NP3LJOX9KM271936	AK9646	DIST			NEW	
W-363	2018	FORD	ESCAPE ZMUDA	1FMCU9GD8JUD01779	AV2429	ENG	235/55R/17	Sep-18	NEW	

W-364	2018	JCB	3CX-15 BACKHOE	JCB3CXPCEJ2517339	AJ6382	DIST	19.5L-24-12	Sep-18	NEW	
W-365	2018	JCB	3CX-15 BACKHOE	JCB3CXPCEJ2517365	AJ6380	DIST	14-17.5-10	Sep-18	NEW	
W-366	2018	FORD	F-150	1FTFW1E55JFE69442	AJ6125	DIST		Oct-18	NEW	
RETIRED 2009 - 2010										
W-085	1983	CHEVY	SALT SPREADER	1GBK7D1F3DV114005	L49654	WARD	9.00X20	Nov-05	POOR	D
W-128	1985	CHEVY	FLATBED	1GBG6D1FXJV101806	L49661	S.C.	9.00X20	Feb-09	POOR	D
W-129	1988	CHEVY	4DR CREW CAB	1GCGR23K2JJ118219	L49662	S.C.	LT235X75R15	Apr-09	POOR	G
W-136	1989	CHEVY	3500 CREW CAB	1GCGR33K5KF306419	K43678	S.C.	LT235X85R16	May-09	POOR	G
W-138	1989	CHEVY	3500 CREW CAB	1GCGR33K8KF306592	K85414	S.C.	LT235X85R16	May-09	POOR	G
W-145	1992	INTERNATIONAL	REPAIR TRUCK	1HTSDNSNONH402048	K85443	S.C.	11.00RX22.5	Dec-08	POOR	D,U
W-146	1992	INTERNATIONAL	REPAIR TRUCK	1HTSDNSN9NH402047	K85453	S.C.	11.00RX22.5	Jun-09	POOR	D,U
W-152	1933	CHEVY 4X4	3500 9'SERVICE BODY	1GBJK34FXPE246148	L49671	S.C.	LT225X75R16 R-DUALS	Jan-09	POOR	D
W-158	1994	CHEVY	P/U C2500	1GCFC24Z0RZ277259	L49675	S.C.	235X75R15	Feb-09	GOOD	G
W-159	1994	CHEVY	P/U C2500	1GCFC24Z2RZ278137	L49676	WARD	235X75R15	Sep-08	GOOD	G
W-162	1994	CHEVY 4X4	3500 9' SERVIC BODY	1GBJK34F2RE299848	L49679	S.C.	225R75R16 - R DUALS	Sep-08	GOOD	D
W-166	1995	CHEVY	G-2500 CARGON VAN	1GCEG25Z3SF143352	L49681	WARD	235X75R15	May-09	POOR	G
W-173	1997	CHEVY	S-10 P/U	1GCCS14X7VK211230	L49686	S.C.	205X75R15	Mar-09	GOOD	G
W-174	1997	CHEVY	S-10 P/U	1GCCS14X1VK210557	L49687	S.C.	205X75R15	Mar-09	GOOD	G
W-176	1997	CHEVY	S-10 P/U	1GCCS14XXVK209066	L49689	S.C.	205X75R15	Mar-09	GOOD	G
W-201	1998	JEEP	CHEROKEE	1J4FJ28SXL211622	L67088	S.C.	P215RX75R15	Mar-09	GOOD	G
RETIRED 2010 - 2011										
W-065	1973	E-Z TRAILER	E-Z TRAILER	722236	L49653	WARD	20-900	May-09	GOOD	
W-097	1984	SULLAIR	AIR COMPRESSOR	00485725 S/N593166CD	L49655	S.C.	P215/75R15		GOOD	D
W-149	1993	INGERSOL RAND	COMPRESSOR P185WJD	237989UHD328	L49668	S.C.	215X75R15		GOOD	D
W-150	1993	INGERSOL RAND	COMPRESSOR P185WJD	237990UHD328	L49669	JOSLYN	215X75R15		GOOD	D
W-155	1994	INGERSOL RAND	COMPRESSOR P185WJD	241986UKE328	L49672	S.C.	215X75R15		GOOD	D
W-156	1994	INGERSOL RAND	COMPRESSOR P185WJD	241985UKE328	L49673	S.C.	215X75R15		GOOD	D
W-169	1996	INTERNATIONAL	REPAIR TRUCK	1HTSDAAN5TH409164	L49683	BAILEY	11.00RX22.5	Sep-08	GOOD	D,U
W-172	1997	FORD	F-350 REPAIR TRUCK	1FDKF37F0VEA94924	L49685	S.C.	215X85R16	May-09	GOOD	D
W-175	1997	CHEVY	S-10 P/U	1GCCS14X0VK209870	L49688	S.C.	205X75R15	Mar-09	GOOD	G
W-177	1997	CHEVY	S-10 P/U	1GCCS14X9VK208748	L49690	S.C.	205X75R15	Mar-09	GOOD	G
W-237	1983	INGERSOL RAND	COMPRESSOR P185WJD	4239DE00607115CD	NONE	S.C.	215X75R15(old w spare1)		GOOD	D
W-238	1983	INGERSOL RAND	COMPRESSOR P185WJD	4239DF00607124CD	NONE	S.C.	215X75R15(old w spare2)		GOOD	D

RETIRED 2011 - 2012										
W-111	1985	CLARK	TOWMOTOR	GP138MC02545533FA		S.C.	700X12 650-16NH		GOOD	G
W-160	1994	CHEVY	P/U C2500	1GCFC24Z9RZ277700	111648			Apr-09	GOOD	G
W-161	1994	CHEVY	P/U C2500	1GCFC24K8RZ277948	63680			Feb-09	GOOD	G
W-168	1995	INTERNATIONAL	DUMP TRUCK	1HTSDAAR0SH639759	L49682	S.C.	12RX22.5	Jun-09	GOOD	D
W-170	1996	INTERNATIONAL	REPAIR TRUCK	1HTSDAAN7TH409165	L49684	S.C.	11.00RX22.5	Feb-09	GOOD	D,U
W-178	1997	CHEVY 4X4	3500 BLK TOP DUMP	1GBHK34R0VF028204	K12278	S.C.	LT225X75R16	Aug-08	GOOD	G
W-179	1997	CHEVY 4X4	3500 BLK TOP DUMP	1GBHK34R5VF048822	70000			Sep-08	GOOD	G
W-181	1997	CHEVY	G2500 VAN	1GCFG25W8V1096122	K12270	WARD	LT225X75R16	Mar-09	GOOD	G
W-184	1998	EH WACHS TRAIL	TLV700-D 10000# GVW	TVL700D98132		S.C.	trl only, engine mtd #218		GOOD	
W-188	1998	CHEVY	G2500 VAN	1GCFG25W4W1108655	96000			May-09	POOR	G
W-189	1998	CHEVY	G2500 VAN	1GCFG25W5W1108003	110000			Apr-09	POOR	G
W-190	1999	FORD	E-250 VAN	1FTNE2429XHB54166	K43649	WARD	LT245X75R16	Aug-09	POOR	G
W-191	1999	NEW HOLLAND	675E BACKHOE	BE900180	L56778	S.C.	11LX16 16.9X28		GOOD	D
W-192	1999	FORD	E-250 VAN	1FTNE2421XHB54159	K43648	WARD	LT245X75R16	Mar-09	POOR	G
W-193	1999	FORD	E-250 VAN	1FTNE2428XHB60556	75114			Apr-09	GOOD	G
W-195	1999	FORD	E-250 VAN	1FTNE2426XHB60555	114553			Mar-09	GOOD	G
W-196	1999	FORD	E-250 VAN	1FTNE242XXHB54161	K43647	S.C.	LT245X75R16	May-09	GOOD	G
W-197	1999	FORD	E-250 VAN	1FTNE242XXHB60557	86196			Mar-09	GOOD	G
W-200	1998	JOHN DEERE	LAWN TRACTOR	LV0855E201932		WARD			GOOD	D
W-203	2001	NEW HOLLAND	BACKHOE LB110	31029923 BV781465	K12230	S.C.	11X16 16.9X28		GOOD	D
W-204	2001	INTERNATIONAL	DUMP TRUCK	1HTSCAAR61H386349	L82753	S.C.	12.00RX22.5	Mar-09	GOOD	D
W-205	2001	FORD	E-350 VAN	1FTSE34L21HB66393	101967			May-09	GOOD	G
W-206	2001	FORD	E-350 VAN	1FTSE34L01HB66392	K12698	METERS	LT245X75R16	May-09	GOOD	G,U
W-209	2004	CHEVY 4X4	SILVERADO EXT CAB	1GCEK19V44E315509	L56790	S.C.	P24575R16	Apr-09	GOOD	G
W-214	2004	NEW HOLLAND	75.B BACKHOE	31050090	R17837	S.C.	11X16 16.9X28		GOOD	D
W-216	2004	CHEVY 4X4	SILVERADO REG CAB	1GCEK14VX4E351941	L57324	S.C.	P245/75R16	Aug-09	GOOD	G
W-217	2004	CHEVY 4X4	SILVERADO EXT CAB	1GCEK19V14E348631	L57400	S.C.	P245/75R16	May-09	GOOD	G
W-219	2004	CHEVY 4X4	3500 11' SERV BODY	1GBJK34U74E339512	L60528	S.C.	LT225/75R16 DRW	Oct-08	GOOD	G,U
W-221	2005	CHEVY VAN	G-2500 CARGON VAN	1GCGG25V351236265	L96312	METERS	LT225/75R16	May-09	GOOD	G
W-222	2005	CHEVY VAN	G-2500 CARGON VAN	1GCGG25V551236395	L96311	METERS	LT225/75R16	May-09	GOOD	G
W-225	2005	CHEVY 4X4	SIVVERADO 1500	1GCEK14V15Z301889	L96316	S.C.	LT265/70R17	Aug-09	GOOD	G
W-226	2005	CHEVY PICK UP	SILVERADO 1500	1GCEC14X25Z302791	L96317	S.C.	LT265/70R17	Aug-09	GOOD	G
W-231	2006	CHEVY 4x4	3500 9' SERVICE BODY	1GBJK34U56E277126	L96387	S.C.	LT215/85R16 DRW	Jul-09	GOOD	G
W-233	2006	CHEVY EXPRESS	G-2500 CARGON VAN	1GCG25V761257766	L96384	S.C.	LT235/85R16	May-09	GOOD	G
W-236	2007	FORD	E-250 VAN	1FTNE24W27DB45805	M35935	S.C.	LT245X75R16	Aug-08	NEW	G



W-276	2011	FORD 4X4	F-150 EXT CAB / Martin	1FTFX1EF3BKD79950	R21579	SUPT	LT235/75R17		Totaled	
RETIRED 2013 - 2014										
W-167	1995	INTERNATIONAL	FLATBED	1HTSCAAN9SH640036	K12274	S.C.	11.00RX22.5	Apr-09	GOOD	D,U
W-215	2004	CHEVY 4X4	SILVERADO REG CAB	1GCEK14V14E346854	L57323	S.C.	P245/75R16	May-09	GOOD	G
W-220	2005	CHEVY 4X4	SILVERADO EXT CAB	2GCEK19VX51233920	L87226	S.C.	LT265/70R17	Dec-08	GOOD	G
W-223	2005	CHEVY 4X4	SILVERADO EXT CAB	2GCEK19V751338561	L96310	WARD	LT265/70R17	May-09	GOOD	G
W-224	2005	CHEVY 4XX PLOW	SILVERADO HD2500	1GCHK24U65E296822	L96315	WARD	LT265/70R17	Aug-08	GOOD	G
W-230	2006	CHEVY 4X4	3500 9' SERVICE BODY	1GBJK34UX6E164272	L96335	JOSLYN	LT215/85R16 DRW	Jan-09	GOOD	G
W-232	2006	CHEVY 4X4	3500 9' SERVICE BODY	1GBJK34U66E277877	L96388	S.C.	LT215/85R16 DRW	Jul-09	GOOD	G
W-234	2006	CHEVY 4X4	3500 11' SERV BODY	1GBJK34G86E278488	M25708	BAILEY	LT225/75R16 DRW	Jul-08	GOOD	G,U
W-235	2007	CHEVY 4X4	3500 9' SERVICE BODY	1GBJK34U77E151111	M25754	S.C.	LT225/75R16 DRW	Jan-09	GOOD	G
W-239	2009	FORD 4X4	F-350 PLOW/SALTER	1FDWF37Y89EA37234	M51743	WARD	LT245X75R17 DRW	Feb-09	GOOD	G
W-242	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E49PA47362	M61893	READER	P235/75R15	May-09	GOOD	G
W-243	2009	FORD	E-250 CARGO VAN	1FTNE24W89DA79893	M61753	METERS	LT245/75R16	Jun-09	GOOD	G
W-244	2009	FORD	E-250 CARGO VAN	1FTNE24WX9DA79894	M61752	METERS	LT245/75R16	Jun-09	GOOD	G
W-245	2009	FORD	E-250 CARGO VAN	1FTNE24W19DA79895	M61751	METERS	LT245/75R16	Jun-09	GOOD	G
W-246	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E39PA55940	M61759	READER	P235/75R15	Jun-09	GOOD	G
W-247	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E59PA55941	M61760	INSP	P235/75R15	Jun-09	GOOD	G
W-248	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E79PA55942	M61761	INSP	P235/75R15	Jun-09	GOOD	G
W-249	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E99PA55943	M61762	INSP	P235/75R15	Jun-09	GOOD	G
W-250	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E29PA55945	M61763	READER	P235/75R15	Jun-09	GOOD	G
W-251	2009	FORD 4X4	RANGER EXTENDED CAB	1FTYR15E09PA55944	M61764	WARD	P235/75R15	Jun-09	GOOD	G
W-252	2009	FORD	E-250 CARGO VAN	1FTNE24W39DA79896	M61765	METERS	LT245/75R16	Jun-09	GOOD	G
W-253	2009	FORD 4X4	F-350 9' KP DUMP	1FDWF37Y89EB25684	M61768	S.C.	LT245X75R17 DRW	Jun-09	GOOD	G
W-254	2009	FORD 4X4	F-350 FLAT BED (non-pay)	1FDWF37YX9EB25685	M61769	S.C.	LT245X75R17 DRW	Jun-09	GOOD	G
RETIRED 2014 - 2015										
W-134	1988	CLARK	TOWMOTOR	G12714146790FA		F.P.	700X12 600 10NHS		POOR	G
RETIRED 2015 - 2016										
W-198	1999	NEW HOLLAND	SKID STEER	102174	L49692	S.C.	LX855S		GOOD	D
RETIRED 2016 - 2017										
W-210	2005	INTERNATIONAL	7300 10 TON DUMP	1HTWAAAR75J036394	R17808	S.C.	12.00RX22.5	Apr-09	GOOD	D
W-321	2015	BOBCAT	E42 EXCAVATOR	B2VW11916		DIST				
RETIRED 2017 - 2018										



[illegible]

# Collection Performance and Activities

## Collection Performance and Activities

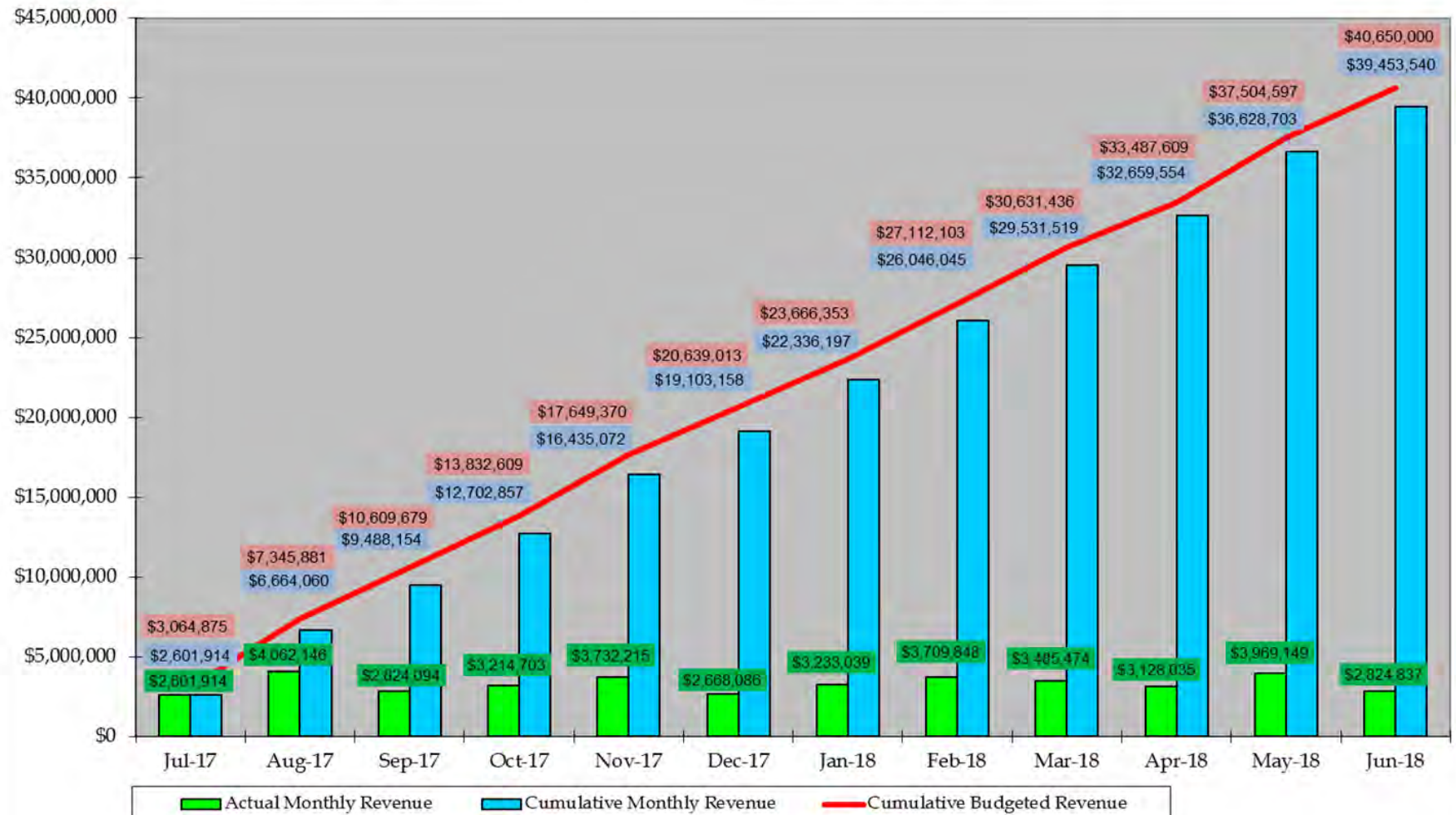
Accounts Receivable	Unbilled	< 90	90-179	180-269	270-359	360+	Totals:
Unmetered Quarterly	\$321,280	\$362,456	\$189,767	\$143,437	\$136,810	\$2,224,116	\$3,377,866
Metered Monthly	\$262,992	\$103,657	\$61,482	\$41,903	\$8,107	\$708,584	\$1,186,726
Metered Quarterly	\$373,112	\$2,424,220	\$727,370	\$391,275	\$372,081	\$4,147,668	\$8,435,727
TOTAL All Accounts	\$957,384	\$2,890,334	\$978,618	\$576,615	\$516,999	\$7,080,368	\$13,000,319

Commission Water Fee						\$922,063	\$922,063
----------------------	--	--	--	--	--	-----------	-----------

Cumulative	Current Year	Previous Year	Variance	% Change
Charges	\$40,076,389	\$40,383,566	(\$307,177)	-0.76%
Adjustments	(\$593,979)	(\$446,021)	(\$147,958)	-33.17%
Net Charges	\$39,482,410	\$39,937,546	(\$455,136)	-1.14%
Revenues	\$39,453,540	\$40,215,993	(\$762,453)	-1.90%
Percent of Collections	99.93%	100.70%	-0.77%	



## Actual Service Revenue vs Budgeted Revenue Contract Year 8



\*Service revenues reported are from cash receipts from flat billed, monthly metered, & quarterly metered water rates.

# Customer Service Issues and Discussion

## CUSTOMER SERVICE ISSUES AND DISCUSSION

For the duration of CY8, Veolia has continued to utilize customer issues and complaints as an opportunity to identify ways to grow, develop and improve as an organization. As in past contract years, we have utilized training and technology to enable City personnel to address customer concerns in an efficient and timely fashion.

Customer issues and complaint management is an essential component to Buffalo Water's success. Allowing such expressions of dissatisfaction to be met with positive responses and improvements are crucial to our business. Veolia understands this, and will remain committed to improve by introducing new technologies and process improvements in partnership with Buffalo Water to better serve customers.



# General Plant Conditions

## General Plant Conditions – Facility Improvements

### **Colonel Ward Pumping Station:**

Valve House – Other than routine operation and maintenance of equipment (dehumidifiers, air handlers, etc.), there has not been any major capital work in the Valve House since the Electrical Upgrades Project that was completed in the first quarter of CY7. Veolia again recommends replacing the existing hydraulic valve actuators located in the valve house.

Pump Station – The pump and valve maintenance service contract was again renewed with Corrosion Products & Equipment (CPE) to provide necessary PM for pumps and valves located at the Colonel Ward pumping station. A new 20 MGD pump and soft starter with associated valves was installed during CY7-CY8. SCADA system upgrades continued through CY8 providing operations personnel with a greater level of control and trending capabilities, and these upgrades will also continue into CY9. New SCADA communications hardware was installed to replace the outdated telephone leased line system. HVAC system monitoring was added to the SCADA system to monitor the newly installed unit heaters, air handlers and boilers. New HVAC rooftop units were installed at the administration and engineering buildings. Installation of a new plant-wide camera security system was started.

Generators – Contractor PM and bump testing utilizing Kinsley Power Systems for the Colonel Ward emergency generators was again performed during CY8. During CY8, a load test of the generator systems was conducted utilizing a mobile load bank, permitting both generators to be tested under full load, simulating full operation of the pump station. The next phase of generator testing is to transfer all power from the line side to the generators. An electrical coordination study was started in preparation for the transfer of power testing. Some 100 amp electrical conductors were also upsized as part of this effort.

Due to the lack of in-house expertise specific to the generators, Veolia again recommends a PM contract with outside labor be issued for CY9 until staffing permits this work to be performed by City personnel.

### **Massachusetts Avenue Pumping Station:**

Several improvements occurred at the Massachusetts Avenue Pumping Station during CY8, which include the following work:

#### **Electrical Components and Substation -**

Mechanical relays were replaced with Schweitzer relays by Ferguson Electric on pump Nos. 1, 2 & 4. These new relays allow for collection of the electrical historical data necessary for enhanced troubleshooting of electrical system problems when they occur.

It is anticipated that there will be ongoing electrical challenges which will be addressed as they occur until such time that a full overhaul of all electrical components for the pump station occurs. Nussbaumer and Clarke is currently performing a comprehensive evaluation of all major electrical components at the pump station as well as the associated substation.

**Mechanical** – Similarly to the Colonel Ward pumping station, CPE is providing PM related services for high service pumps and valves at the Massachusetts Avenue Pumping Station. Routine work was performed as required on mechanical equipment during CY8.

**Building Envelope** - The City largely completed a capital project to facilitate roofing repairs to the Massachusetts Avenue Pumping Station during CY8, which included repairs to the perimeter fence and structural deficiencies.

## **Treatment Plant:**

Residuals Dewatering – Both north and south sedimentation basins were taken out of service independently for annual cleaning to remove accumulated residuals. Residuals transfer operations conveyed residuals from the basins to either the residuals lagoon or centrifuge feed tank for subsequent processing. Dewatering operations utilizing the dewatering centrifuge successfully processed 595 dry tons of accumulated residuals for CY8. This is a significant reduction in the amount of residuals processed largely due to operations efficiencies identified by Veolia and subsequently implemented by City personnel (i.e. optimizing flocculator speeds, reduction in coagulant dosage). Residuals processing operations conducted in 2018 commenced in April, and are anticipated to be complete during the second quarter of CY8.

While City personnel performed all cleaning operations associated with removing residuals from the sedimentations basins, City personnel did not operate the centrifuge during CY8. Continued efforts will be made during CY9 to train City personnel to assume ownership and operation of the residuals dewatering process.

Filter Plant – Major improvements and accomplishments at the filtration plant during CY8 included the following:

- A service contract was renewed with Hach® to perform PM for all laboratory/regulatory reporting instrumentation ensuring proper calibration, function and reliability. PM for the 40 filter turbidimeters was performed by City personnel, which was the intended transition once personnel were adequately trained.
- Evoqua Water Technologies (Evoqua) was again retained to provide required PM for the chlorine gas feed system. Evoqua also provided PM training for filter plant personnel with the goal of City personnel performing PM for the chlorine system in subsequent years.
- Evoqua also provided maintenance services to restore operation to the east raw water screen. This work is understood to be a temporary repair until a capital project can replace both antiquated screens in their entirety with current equipment.
- AnCor Industrial Services completed removal and replacement PACl bulk storage tank Nos. 3 and 5, with new fiberglass reinforced polyester (FRP) tanks.
- A major upgrade was made to the SCADA system by combining the original Rockwell RSView®32™ system at the Filter Plant with the RSView®32™ system at the Pumping plant. This combined system was then upgraded to one Rockwell FactoryTalk® View SE system to encompass the Pumping Plant, Filter Plant and tank sites. New computers were also installed throughout the plant.

Veolia again recommends that the following items are considered during CY9:

- Topping-off of filters with anthracite media as required.

- Incorporation of streaming current monitoring to optimize the pretreatment process, reduce chemical usage and subsequently residuals production.
- Further migrate and populate process and operational information into Hach WIMS™ software for data storage and trending.
- Conversion from chlorine gas to sodium hypochlorite as the primary disinfection chemical. This would provide an inherently safer alternative to City personnel and the surrounding community.
- Capital projects associated with repair of the raw water screens, replacement of remaining PACl bulk storage tanks and repairs to the filter sweeps and supply piping.

### **Tank Sites:**

In general, at all tank sites, the following SCADA improvements under the Siemens project occurred: obsolete Rockwell SLC 500 Controllers were upgraded to Rockwell ControlLogix Controllers, 20 inch Siemens HMI screens were added to Ward, Mass, Grover and Manhattan, remote control of fill and drain valves via the SCADA system is now possible, installation of chlorine analyzers and monitoring by the SCADA system and upgrade of the camera DVRs and security switches.

Grover – Other than routine operation and maintenance, there wasn't any significant capital investment at the Grover Tank and pump station. The existing stairwell leading to the top of the tank requires repair/replacement, and should be considered for a future capital project.

Hancock – The tank was drained and inspected utilizing a remotely operated vehicle (ROV) during CY8. Overall, the tank was found to be in good condition. It is recommended that the tank be drained and inspection on a recurring basis every 3-4 years.

Manhattan – Major upgrades to the pumping system and electrical switchgear that began during CY7, continued into CY8. A new motor control center and electrohydraulic valve actuators were integrated with the system wide SCADA system. This allows for replacement of obsolete infrastructure and better control of Manhattan station pressure fluctuations.

Ferry – The tank was drained and inspected utilizing a remotely operated vehicle (ROV) during CY8. Overall, the tank was found to be in good condition. It is recommended that the tank be drained and inspection on a recurring basis every 3-4 years.

Kensington – Removed from service during CY5, and currently remains out of service.

Grounds maintenance was improved during CY8 at all remote tank locations with the support of increased staffing levels.

# Outstanding Work Order Summary



## OUTSTANDING WORK ORDER SUMMARY

The following is a report of outstanding work orders for AGAM and Underground Asset Management (UGAM). Work orders relevant to AGAM are created and completed in OWAM. These work orders primarily include work that pertains to plant operations and maintenance. UGAM work orders are created and completed in InfoNet™, a geodatabase that tracks the status of distribution parts, maintenance, and updates.

Work orders included in these lists are either outstanding work orders that still require scheduling, or the work orders were completed and are not appropriately indicated in the system. Updates will continue to be performed to indicate work orders as completed in the appropriate CMMS.



## BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
<b>4/2011</b>			
4/22/2011	1100243	CM on Kensington Tower to repair roof leak and front steps.	MAINT
<b>10/2011</b>			
10/17/2011	1100810	ROOF LEAKING ON SOUTH END OF BALCONY - CALL CONTRACTOR - PER WO1100655	MAINT
<b>9/2014</b>			
9/1/2014	1400989	ANNUAL BAR SCREEN DRIVE PdM SERVICE	MAINT
9/1/2014	1400991	Annual Pump Oil Testing/Change BWA-PRD-MAS5-High Service-P4-PumpsI Pump	MAINT
9/1/2014	1400992	Annual Pump Oil Testing/Change - BWA PRD Balcony High Service - P3 pumps/pump	MAINT
9/1/2014	1400993	Annual Electrical MCC PM BWA-PR~MASS-Electrical MCCIMCC	MAINT
9/1/2014	1400995	Annual Calibration to Transmitters	MAINT
9/9/2014	1401030	Annual Electrical MCC PM	MAINT
<b>10/2014</b>			
10/1/2014	1401117	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
<b>11/2014</b>			
11/1/2014	1401365	Annual Flocculator Speed Changes - Speed Up	MAINT
<b>12/2014</b>			
12/1/2014	1401437	ANNUAL MASS AVE. HIGH SERVICE MOTOR PM	MAINT
<b>3/2015</b>			
3/1/2015	1500206	Annual Low Lift Pump Oil Testing/Change	MAINT
<b>4/2015</b>			
4/1/2015	1500392	ANNUAL LOW LIFT PUMP / MOTOR & ELECTRICAL SERVICE	MAINT
4/1/2015	1500393	Annual Basin Sluice Gate PM	MAINT
4/1/2015	1500394	Annual Flocculator Oil & Grease PM - South	MAINT
4/1/2015	1500395	Annual Flocculator Oil & Grease PM -North	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
<b>5/2015</b>			
5/1/2015	1500505	ANNUAL EXERCISE 90" FINISHED WATER CONDUIT VALVES	MAINT
<b>6/2015</b>			
6/1/2015	1500602	ANNUAL BAR SCREEN DRIVE PM SERVICE	MAINT
<b>7/2015</b>			
7/1/2015	1500704	ANNUAL SLUDGE THICKENER TANK CLEANING	MAINT
<b>9/2015</b>			
9/1/2015	1500921	ANNUAL BAR SCREEN DRIVE PdM SERVICE	MAINT
9/1/2015	1500923	Annual Pump Oil Testing/Change BWA-PRD-MAS5-High Service-P4-PumpsI Pump	MAINT
9/1/2015	1500924	Annual Calibration to Transmitters	MAINT
9/1/2015	1500927	Annual Pump Oil Testing/Change BWA-PRD-Manhattan-Pumps/Pump	MAINT
<b>10/2015</b>			
10/15/2015	1501096	ANNUAL BACKFLOW PREVENTER TEST	MAINT
<b>1/2016</b>			
1/1/2016	1500996	PENT-ANNUAL MASS AVE. HIGH SERVICE PUMP/MOTOR OVERHAUL	MAINT
<b>2/2016</b>			
2/1/2016	1600060	ROUND HOUSE CORRECTIVE MAINTENANCE	MAINT
2/19/2016	1600115	REPAIRS TO MASSACHUSETTS AVENUE FENCING AND BUILDING MAINTENANCE	MAINT
2/19/2016	1600116	MAINTENANCE AROUND HANCOCK TANK	MAINT
2/19/2016	1600117	MAINTENANCE AROUND FERRY TANK	MAINT
2/8/2016	1600118	Annual Cleaning of PACL Tanks	MAINT
<b>3/2016</b>			
3/1/2016	1600147	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 30	MAINT
3/1/2016	1600149	Annual Low Lift Pump Oil Testing/Change	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
3/7/2016	1600247	EXCHANGE STREET MAINTENANCE	MAINT

## 4/2016

4/1/2016	1600271	Semi-Annual Balcony Crane Lubrication and Certification	MAINT
4/1/2016	1600277	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 34	MAINT
4/1/2016	1600281	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
4/1/2016	1600282	SEMI-ANNUAL LOW LIFT PUMP / MOTOR LUBE PM	MAINT
4/1/2016	1600283	ANNUAL LOW LIFT PUMP / MOTOR & ELECTRICAL SERVICE	MAINT
4/1/2016	1600284	Annual Flocculator Oil & Grease PM - South	MAINT
4/1/2016	1600287	Annual Flocculator Oil & Grease PM -North	MAINT
4/1/2016	1600290	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 10	MAINT
4/1/2016	1600294	ANNUAL HIGH SERVICE P4 & P5 INSPECTION	MAINT
4/1/2016	1600296	SEMI-ANNUAL HIGH SERVICE P4 & P5 INSPECTION	MAINT

## 5/2016

5/1/2016	1600391	ANNUAL CONTROL PANEL SERVICE	MAINT
5/1/2016	1600393	Thickener Annual Spur Gear PM	MAINT
5/15/2016	1600467	Annual Elevator Inspection	MAINT

## 6/2016

6/1/2016	1600503	ANNUAL BAR SCREEN DRIVE PM SERVICE	MAINT
6/1/2016	1600504	SEMI-ANNUAL MASS AVE. HIGH SERVICE PUMP PM	MAINT
6/1/2016	1600507	SEMI-ANNUAL MASS AVE. HIGH SERVICE MOTOR PM	MAINT
6/1/2016	1600519	Annual Chlorine Equipment Checks	MAINT

## 7/2016

7/8/2016	1600617	YEARLY RE-CERTIFICATION FOR SPARE CHLORINE GAS EMERGENCY SHUT OFF VALVE (HALOGEN VALVE 16/16, CR715-9)	MAINT
7/1/2016	1600643	Quarterly Backwash Pump Lube PM	MAINT
7/1/2016	1600644	ANNUAL CONTROL PANEL SERVICE	MAINT
7/1/2016	1600646	Semi-Annual Cleaning of Head House Raw Water Lines	MAINT
7/1/2016	1600647	ANNUAL SLUDGE THICKENER TANK CLEANING	MAINT
7/1/2016	1600648	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
7/1/2016	1600650	SEMI-ANNUAL CONE VALVE INSPECTION - MASS STATION	MAINT
7/1/2016	1600653	SEMI-ANNUAL CENTRIFUGE PM SERVICE	MAINT
7/1/2016	1600656	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
7/1/2016	1600658	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 8	MAINT
7/1/2016	1600660	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 3	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
7/1/2016	1600663	Annual Emergency Raw Water Bi-Pass Valve PM	MAINT
7/1/2016	1600664	Quarterly HF Turbidity Analyzer Calibration	OPER
7/1/2016	1600707	Quarterly Process Room Raw Water Analyzer Calibration	OPER
7/1/2016	1600715	Quarterly HACH Turbidity Calibration	OPER
7/1/2016	1600963	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER
7/1/2016	1601095	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
7/1/2016	1601460	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER

## 9/2016

9/1/2016	1601655	SEMI-ANNUAL MASS AVE. HIGH SERVICE PUMP PM	MAINT
9/1/2016	1601656	SEMI-ANNUAL MASS AVE. HIGH SERVICE MOTOR PM	MAINT
9/1/2016	1601658	Annual Pump Oil Testing/Change BWA-PRD-Manhattan-Pumps/Pump	MAINT
9/1/2016	1601659	Annual Pump Oil Testing/Change - BWA PRD Balcony High Service - P3 pumps/pump	MAINT
9/1/2016	1601660	Annual Pump Oil Testing/Change BWA-PRD-MAS5-High Service-P4-Pumps/Pump	MAINT
9/1/2016	1601661	ANNUAL BAR SCREEN DRIVE PdM SERVICE	MAINT
9/1/2016	1601662	Replace Halogen battery for Control Panels	MAINT
9/1/2016	1601680	Annual Calibration to Transmitters	MAINT
9/1/2016	1601711	Annual Electrical MCC PM BWA-PR-MASS-Electrical MCC/MCC	MAINT
9/1/2016	1601712	Annual Electrical MCC PM	MAINT
9/22/2016	1601826	CORRECTIVE MAINTENANCE: MONTHLY BUILDING INSPECTION	MAINT

## 10/2016

10/1/2016	1601775	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2016	1601776	Quarterly HF Turbidity Analyzer Calibration	OPER
10/1/2016	1601777	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2016	1601783	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 22	MAINT
10/1/2016	1601785	SEMI-ANNUAL HIGH SERVICE P4 & P5 INSPECTION	MAINT
10/1/2016	1601787	Quarterly HACH Turbidity Calibration	OPER
10/1/2016	1601788	Quarterly Backwash Pump Lube PM	MAINT
10/1/2016	1601792	SEMI-ANNUAL LOW LIFT PUMP / MOTOR LUBE PM	MAINT
10/1/2016	1601793	ANNUAL HIGH SERVICE P4 & P5 INSPECTION	MAINT
10/1/2016	1601794	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2016	1601798	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
10/1/2016	1601830	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
10/15/2016	1601860	ANNUAL BACKFLOW PREVENTER TEST	MAINT

## 11/2016

11/1/2016	1601897	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 3	MAINT
11/1/2016	1601899	QUARTERLY EMERGENCY LIGHT TESTING	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
11/1/2016	1601900	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 34	MAINT
11/1/2016	1601901	Annual Flocculator Speed Changes - Speed Up	MAINT

## 12/2016

12/1/2016	1601998	Annual Pump Oil Testing/Change	MAINT
12/1/2016	1601999	ANNUAL MASS AVE. HIGH SERVICE PUMP PM	MAINT
12/1/2016	1602018	Annual Ro-Pure/NaNoPure PM	MAINT
12/1/2016	1602075	REPLACE SUMP PUMP #2	MAINT

## 1/2017

1/1/2017	1602224	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
1/1/2017	1602225	Quarterly HF Turbidity Analyzer Calibration	OPER
1/1/2017	1602226	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
1/1/2017	1602231	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 35	MAINT
1/1/2017	1602233	Quarterly Filter Inspection to the Gas-Fired Heaters	MAINT
1/1/2017	1602234	Semi-Annual Cleaning of Head House Raw Water Lines	MAINT
1/1/2017	1602235	Quarterly HACH Turbidity Calibration	OPER
1/1/2017	1602236	Quarterly Backwash Pump Lube PM	MAINT
1/1/2017	1602237	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
1/1/2017	1602239	SEMI-ANNUAL BAR SCREEN SERVICE	MAINT
1/1/2017	1602240	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
1/1/2017	1602241	Annual Clean PACL Lines BWA-WT-Head House - General Facility Asset	MAINT
1/1/2017	1602266	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
1/1/2017	1602272	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER
1/16/2017	1700022	CLEAN DEBRIS AND PAPER ALONG FENCE LINES	MAINT

## 2/2017

2/1/2017	1700038	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 36	MAINT
2/1/2017	1700040	Annual Backwash Pumps Electrical PM	MAINT
2/1/2017	1700099	REPAIR OR REPLACE FAILED SUMP PUMP	MAINT

## 3/2017

3/1/2017	1700144	SEMI-ANNUAL MASS AVE. HIGH SERVICE PUMP PM	MAINT
3/1/2017	1700145	Annual Cleaning of PACL Tanks	MAINT
3/1/2017	1700147	Annual Low Lift Pump Oil Testing/Change	MAINT
3/1/2017	1700148	SEMI-ANNUAL MASS AVE. HIGH SERVICE MOTOR PM	MAINT
3/1/2017	1700149	Annual Emergency Potable Water BI-Pass Valve PM	MAINT
3/1/2017	1700150	Annual Remote Station Electrical PM	MAINT



# BUFFALO WO AGING REPORT

<u>WO</u> <u>REQUIRED</u> <u>DATE</u>	<u>WORK ORDER</u> <u>NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
---	--------------------------------	------------------	------------------

## 4/2017

4/1/2017	1700258	Annual Elevator Inspection	MAINT
4/1/2017	1700259	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2017	1700260	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2017	1700262	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 8	MAINT
4/1/2017	1700264	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 28	MAINT
4/1/2017	1700265	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 37	MAINT
4/1/2017	1700266	SEMI-ANNUAL HIGH SERVICE P4 & P5 INSPECTION	MAINT
4/1/2017	1700268	Quarterly HACH Turbidity Calibration	OPER
4/1/2017	1700269	Quarterly Backwash Pump Lube PM	MAINT
4/1/2017	1700272	Semi-Annual Balcony Crane Lubrication and Certification	MAINT
4/1/2017	1700274	ANNUAL LOW LIFT PUMP / MOTOR & ELECTRICAL SERVICE	MAINT
4/1/2017	1700275	Quarterly HF Turbidity Analyzer Calibration	OPER
4/1/2017	1700277	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2017	1700278	ANNUAL DRINKING WATER FOUNTAIN PM	MAINT
4/1/2017	1700280	Annual Ward Valve Exercising	MAINT
4/2/2017	1700281	Annual Flocculator Oil & Grease PM - South	MAINT
4/2/2017	1700282	Annual Flocculator Oil & Grease PM -North	MAINT
4/1/2017	1700286	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
4/1/2017	1700367	Quarterly Filter Inspection to the Gas-Fired Heaters	MAINT
4/1/2017	1700368	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
4/1/2017	1700378	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
4/1/2017	1700379	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER

## 5/2017

5/1/2017	1700514	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 18	MAINT
5/1/2017	1700516	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 38	MAINT
5/1/2017	1700517	QUARTERLY EMERGENCY LIGHT TESTING	MAINT
5/1/2017	1700519	Thickener Annual Spur Gear PM	MAINT
5/1/2017	1700521	ANNUAL CONTROL PANEL SERVICE	MAINT
5/23/2017	1700942	REPAIRS / REPLACEMENTS IN SERVICE CENTER AND DISPATCH OFFICE	MAINT

## 6/2017

6/1/2017	1700718	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 10	MAINT
6/1/2017	1700719	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 30	MAINT
6/1/2017	1700720	Semi-Annual High Voltage Glove Checks	MAINT
6/1/2017	1700721	Annual Chlorine Equipment Checks	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
6/1/2017	1700747	ANNUAL BAR SCREEN DRIVE PM SERVICE	MAINT
6/19/2017	1700941	REPAIRS TO GUARD SHACK	MAINT

## 7/2017

7/1/2017	1700878	Quarterly HF Turbidity Analyzer Calibration	OPER
7/1/2017	1700881	QUARTERLY DEHUMIDIFIER MECHANICAL / ELECTRICAL PM	MAINT
7/1/2017	1700885	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 39	MAINT
7/1/2017	1700887	Quarterly Filter Inspection to the Gas-Fired Heaters	MAINT
7/1/2017	1700889	YEARLY RE-CERTIFICATION FOR CHLORINE GAS EMERGENCY SHUT OFF VALVES (HALOGEN)	OPER
7/1/2017	1700890	Semi-Annual Cleaning of Head House Raw Water Lines	MAINT
7/1/2017	1700891	ANNUAL SLUDGE THICKENER TANK CLEANING	MAINT
7/1/2017	1700894	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
7/1/2017	1700896	SEMI-ANNUAL BAR SCREEN SERVICE	MAINT
7/1/2017	1700897	Annual Emergency Raw Water Bi-Pass Valve PM	MAINT
7/1/2017	1700898	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
7/1/2017	1700905	Quarterly HACH Turbidity Calibration	OPER
7/1/2017	1700908	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
7/1/2017	1700909	Monthly Massachusetts Ave. Pumping Station Operator PM	OPER
7/1/2017	1700912	MONTHLY HVAC INSPECTION (heaters)	MAINT
7/1/2017	1700914	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
7/1/2017	1700917	MONTHLY EMERGENCY LIGHT TESTING	MAINT
7/1/2017	1700919	Monthly Generator Inspection and Manual Test - New Generators	MAINT
7/1/2017	1700940	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER
7/1/2017	1700944	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
7/1/2017	1700945	Monthly Lab Finished Water Chlorine Analyzer Calibration	OPER
7/1/2017	1700949	MONTHLY DEHUMIDIFIER MECHANICAL INSPECTION	MAINT
7/1/2017	1700950	MONTHLY SPARE FLOCCULATOR "TURNING"	MAINT
7/3/2017	1700953	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
7/3/2017	1700956	CLEAN DEBRIS AND PAPER ALONG FENCE LINES	MAINT
7/24/2017	1701012	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
7/24/2017	1701013	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
7/24/2017	1701017	WEEKLY HIGH SERVICE P4 & P5 INSPECTION	MAINT
7/24/2017	1701019	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
7/24/2017	1701027	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
7/24/2017	1701043	BI-WEEKLY HVAC INSPECTION (air conditioners)	MAINT
7/31/2017	1701047	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT

## 8/2017

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
8/1/2017	1701005	ANNUAL PM - CENTRIFUGE MANUFACTURER RECOMMENDED	MAINT
8/1/2017	1701007	QUARTERLY EMERGENCY LIGHT TESTING	MAINT
8/1/2017	1701008	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 32	MAINT
8/1/2017	1701009	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 40	MAINT
8/1/2017	1701029	MONTHLY PM - CENTRIFUGE MANUFACTURER RECOMMENDED	MAINT
8/1/2017	1701030	MONTHLY EMERGENCY LIGHT TESTING	MAINT
8/1/2017	1701031	MONTHLY HIGH SERVICE P4 & P5 INSPECTION	MAINT
8/1/2017	1701034	MONTHLY AIR COMPRESSOR SERVICE	MAINT
8/1/2017	1701037	MONTHLY BUILDING INSPECTION	MAINT
8/1/2017	1701038	MONTHLY LOW LIFT PUMP INSPECTION	MAINT
8/1/2017	1701039	MONTHLY HVAC INSPECTION (heaters)	MAINT
8/1/2017	1701065	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
8/1/2017	1701067	Monthly Portable Gas Detector Calibrations	MAINT
8/1/2017	1701069	MONTHLY DEHUMIDIFIER MECHANICAL INSPECTION	MAINT
8/1/2017	1701072	MONTHLY SPARE FLOCCULATOR "TURNING"	MAINT
8/7/2017	1701081	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
8/14/2017	1701100	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
8/21/2017	1701129	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
8/21/2017	1701132	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
8/21/2017	1701136	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
8/28/2017	1701175	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
8/28/2017	1701177	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
<b>9/2017</b>			
9/1/2017	1701142	ANNUAL BAR SCREEN DRIVE PdM SERVICE	MAINT
9/1/2017	1701144	YEARLY RE-CERTIFICATION FOR SPARE CHLORINE GAS EMERGENCY SHUT OFF VALVE (HALOGEN VALVE 16/16, CR715-9)	MAINT
9/1/2017	1701154	MONTHLY SPARE FLOCCULATOR "TURNING"	MAINT
9/1/2017	1701156	MONTHLY DEHUMIDIFIER MECHANICAL INSPECTION	MAINT
9/1/2017	1701163	MONTHLY BUILDING INSPECTION	MAINT
9/1/2017	1701165	MONTHLY HVAC INSPECTION (heaters)	MAINT
9/1/2017	1701185	Annual Electrical MCC PM BWA-PR-MASS-Electrical MCCIMCC	MAINT
9/1/2017	1701186	Annual Electrical MCC PM	MAINT
9/11/2017	1701216	Weekly Chlorine Gas Detector PM	OPER
9/18/2017	1701225	DAILY HOUSEKEEPING TASKS	MAINT
9/18/2017	1701235	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
9/25/2017	1701270	WEEKLY HOUSEKEEPING - FILTER PLANT	MAINT
9/25/2017	1701271	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
9/25/2017	1701272	Weekly Chlorine Gas Detector PM	OPER

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
9/25/2017	1701273	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
9/25/2017	1701274	WEEKLY HOUSEKEEPING - LABORATORY	MAINT
9/25/2017	1701279	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
9/25/2017	1701280	WEEKLY HOUSEKEEPING - FILTER PLANT CONFERENCE ROOM	MAINT

## 10/2017

---

10/1/2017	1701244	Quarterly HF Turbidity Analyzer Calibration	OPER
10/1/2017	1701245	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2017	1701246	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2017	1701247	QUARTERLY DEHUMIDIFIER MECHANICAL / ELECTRICAL PM	MAINT
10/1/2017	1701250	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 22	MAINT
10/1/2017	1701254	Quarterly HACH Turbidity Calibration	OPER
10/1/2017	1701255	Quarterly Backwash Pump Lube PM	MAINT
10/1/2017	1701256	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
10/1/2017	1701259	SEMI-ANNUAL LOW LIFT PUMP / MOTOR LUBE PM	MAINT
10/1/2017	1701261	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
10/1/2017	1701287	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
10/1/2017	1701290	MONTHLY SPARE FLOCCULATOR "TURNING"	MAINT
10/1/2017	1701294	MONTHLY BUILDING INSPECTION	MAINT
10/1/2017	1701296	MONTHLY EMERGENCY LIGHT TESTING	MAINT
10/1/2017	1701297	Monthly Massachusetts Ave. Pumping Station Operator PM	OPER
10/1/2017	1701298	MONTHLY HVAC INSPECTION (heaters)	MAINT
10/1/2017	1701300	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
10/1/2017	1701301	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER
10/15/2017	1701323	ANNUAL BACKFLOW PREVENTER TEST	MAINT
10/16/2017	1701357	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
10/23/2017	1701396	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
10/23/2017	1701397	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
10/23/2017	1701401	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
10/23/2017	1701411	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
10/30/2017	1701451	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
10/30/2017	1701453	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
10/30/2017	1701454	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
10/30/2017	1701455	BI-WEEKLY HVAC INSPECTION (air conditioners)	MAINT
10/30/2017	1701466	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT

## 11/2017

---

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
11/1/2017	1701377	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 34	MAINT
11/1/2017	1701378	QUARTERLY EMERGENCY LIGHT TESTING	MAINT
11/1/2017	1701379	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 3	MAINT
11/1/2017	1701414	MONTHLY AIR COMPRESSOR SERVICE	MAINT
11/1/2017	1701418	MONTHLY SPARE FLOCCULATOR "TURNING"	MAINT
11/1/2017	1701419	Monthly Visual Inspection of Fire Extinguishers	MAINT
11/1/2017	1701423	Monthly Generator Inspection and Manual Test - New Generators	MAINT
11/1/2017	1701427	MONTHLY BUILDING INSPECTION	MAINT
11/1/2017	1701449	MONTHLY HIGH SERVICE P4 & P5 INSPECTION	MAINT
11/1/2017	1701471	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
11/6/2017	1701486	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
11/6/2017	1701487	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
11/6/2017	1701491	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
11/6/2017	1701499	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
11/6/2017	1701500	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
11/13/2017	1701504	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
11/13/2017	1701506	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
11/13/2017	1701507	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
11/13/2017	1701508	BI-WEEKLY HVAC INSPECTION (air conditioners)	MAINT
11/13/2017	1701511	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
11/13/2017	1701519	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
11/20/2017	1701530	DAILY HOUSEKEEPING TASKS	MAINT
11/20/2017	1701531	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
11/20/2017	1701533	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
11/20/2017	1701534	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
11/20/2017	1701536	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
11/20/2017	1701543	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
11/27/2017	1701575	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
11/27/2017	1701577	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
11/27/2017	1701578	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
11/27/2017	1701579	BI-WEEKLY HVAC INSPECTION (air conditioners)	MAINT
11/27/2017	1701590	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT

# BUFFALO WO AGING REPORT

<u>WO</u> <u>REQUIRED</u> <u>DATE</u>	<u>WORK ORDER</u> <u>NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
---	--------------------------------	------------------	------------------

12/2017

12/1/2017	1701548	Annual Pump Oil Testing/Change	MAINT
12/1/2017	1701549	Semi-Annual High Voltage Glove Checks	MAINT
12/1/2017	1701550	ANNUAL MASS AVE. HIGH SERVICE PUMP PM	MAINT
12/1/2017	1701553	Annual First Aid Station Inspection	MAINT
12/1/2017	1701556	MONTHLY HIGH SERVICE P4 & P5 INSPECTION	MAINT
12/1/2017	1701558	Monthly Portable Gas Detector Calibrations	MAINT
12/1/2017	1701559	QUARTERLY PM CLEAN FILTER CONTROL TABLES	OPER
12/1/2017	1701561	Monthly Visual Inspection of Fire Extinguishers	MAINT
12/1/2017	1701564	Monthly ice machine maintenance.	MAINT
12/1/2017	1701565	Monthly Generator Inspection and Manual Test - New Generators	MAINT
12/1/2017	1701567	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
12/1/2017	1701568	MONTHLY BAR SCREEN INSPECTION	MAINT
12/1/2017	1701570	MONTHLY BUILDING INSPECTION	MAINT
12/1/2017	1701573	MONTHLY EMERGENCY LIGHT TESTING	MAINT
12/1/2017	1701592	QUARTERLY DEHUMIDIFIER ELECTRICAL INSPECTION	MAINT
12/1/2017	1701593	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
12/4/2017	1701611	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
12/4/2017	1701615	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
12/4/2017	1701624	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
12/11/2017	1701633	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
12/11/2017	1701635	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
12/11/2017	1701636	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
12/11/2017	1701640	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
12/11/2017	1701649	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
12/18/2017	1701652	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
12/18/2017	1701654	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
12/18/2017	1701655	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
12/18/2017	1701667	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
12/25/2017	1701692	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
12/25/2017	1701694	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
12/25/2017	1701695	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
12/25/2017	1701697	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
12/25/2017	1701708	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT



# BUFFALO WO AGING REPORT

<u>WO</u> <u>REQUIRED</u> <u>DATE</u>	<u>WORK ORDER</u> <u>NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
<b>1/2018</b>			
1/1/2018	1701669	Annual Clean PACL Lines BWA-WT-Head House - General Facility Asset	MAINT
1/1/2018	1701670	Quarterly HF Turbidity Analyzer Calibration	OPER
1/1/2018	1701672	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
1/1/2018	1701673	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
1/1/2018	1701676	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 5	MAINT
1/1/2018	1701682	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
1/1/2018	1701683	Semi-Annual Cleaning of Head House Raw Water Lines	MAINT
1/1/2018	1701684	Quarterly HACH Turbidity Calibration	OPER
1/1/2018	1701685	Quarterly Backwash Pump Lube PM	MAINT
1/1/2018	1701686	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
1/1/2018	1701689	SEMI-ANNUAL CENTRIFUGE PM SERVICE	MAINT
1/1/2018	1701710	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
1/1/2018	1701713	Monthly Lab Finished Water Chlorine Analyzer Calibration	OPER
1/1/2018	1701715	Monthly Visual Inspection of Fire Extinguishers	MAINT
1/1/2018	1701718	Monthly Generator Inspection and Manual Test - New Generators	MAINT
1/1/2018	1701720	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
1/1/2018	1701721	MONTHLY BAR SCREEN INSPECTION	MAINT
1/1/2018	1701722	Monthly Massachusetts Ave. Pumping Station Operator PM	OPER
1/1/2018	1701726	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
1/1/2018	1701728	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
1/1/2018	1701729	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
1/1/2018	1701732	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
1/1/2018	1701734	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
1/1/2018	1701738	MONTHLY WATER PLANT BUILDING INSPECTIONS (WEEK 3 - OLD BOILER ROOM/CARPENTER/ STOCK ROOM/ MACHINE SHOP & METER SHOP)	MAINT
1/1/2018	1701740	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
1/1/2018	1800001	MONTHLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
1/8/2018	1800004	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
1/8/2018	1800005	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
1/8/2018	1800017	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
1/15/2018	1800021	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
1/15/2018	1800023	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
1/15/2018	1800024	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
1/15/2018	1800029	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
1/15/2018	1800035	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
1/1/2018	1800038	MONTHLY HVAC INSPECTION (heaters)	MAINT
1/22/2018	1800047	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
1/22/2018	1800048	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
1/22/2018	1800049	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
1/22/2018	1800061	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
1/29/2018	1800082	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
1/29/2018	1800083	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
1/29/2018	1800084	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
1/29/2018	1800095	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT

## 2/2018

2/1/2018	1800040	Annual Backwash Pumps Electrical PM	MAINT
2/1/2018	1800041	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 6	MAINT
2/1/2018	1800042	QUARTERLY EMERGENCY LIGHT TESTING	MAINT
2/1/2018	1800043	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 26	MAINT
2/1/2018	1800044	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 36	MAINT
2/1/2018	1800063	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
2/1/2018	1800065	MONTHLY EMERGENCY LIGHT TESTING	MAINT
2/1/2018	1800069	Monthly Visual Inspection of Fire Extinguishers	MAINT
2/1/2018	1800073	Monthly Generator Inspection and Manual Test - New Generators	MAINT
2/1/2018	1800075	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
2/5/2018	1800099	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
2/5/2018	1800104	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
2/12/2018	1800115	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
2/12/2018	1800116	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
2/12/2018	1800117	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
2/12/2018	1800128	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
2/19/2018	1800142	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
2/19/2018	1800143	WEEKLY INSPECTION OF MASS AVE ELECTRICAL EQUIPMENT	MAINT
2/19/2018	1800144	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
2/19/2018	1800146	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
2/19/2018	1800156	WEEKLY INSPECTION OF MANHATTAN & GROVER TOWERS	MAINT
2/26/2018	1800183	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
2/26/2018	1800195	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER

## 3/2018

3/1/2018	1800131	Annual Emergency Potable Water BI-Pass Valve PM	MAINT
3/1/2018	1800132	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 7	MAINT
3/1/2018	1800133	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 27	MAINT
3/1/2018	1800135	Annual Cleaning of PACL Tanks	MAINT
3/1/2018	1800138	Annual Intake Chlorine Start-up	MAINT
3/1/2018	1800139	Annual Low Lift Pump Oil Testing/Change	MAINT
3/1/2018	1800140	SEMI-ANNUAL MASS AVE. HIGH SERVICE MOTOR PM	MAINT
3/1/2018	1800166	Monthly Lab Finished Water Chlorine Analyzer Calibration	OPER
3/1/2018	1800170	MONTHLY POLYMER MIXING PM	MAINT
3/1/2018	1800171	Monthly ice machine maintenance.	MAINT
3/1/2018	1800174	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
3/1/2018	1800179	MONTHLY PM - CENTRIFUGE MANUFACTURER RECOMMENDED	MAINT
3/5/2018	1800198	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT
3/5/2018	1800206	WEEKLY TRASH DUTIES	MAINT
3/12/2018	1800216	WEEKLY HOUSEKEEPING - LABORATORY	MAINT
3/12/2018	1800218	Weekly Chlorine Gas Detector PM	OPER
3/12/2018	1800221	WEEKLY TRASH DUTIES	MAINT
3/19/2018	1800233	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
3/26/2018	1800279	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
3/26/2018	1800283	WEEKLY LOW LIFT BUILDING INSPECTIONS	MAINT

## 4/2018

4/1/2018	1800243	SEMI-ANNUAL BAR SCREEN PM INSPECTION	MAINT
4/1/2018	1800244	Annual Elevator Inspection	MAINT
4/1/2018	1800245	Annual Ward Valve Exercising	MAINT
4/1/2018	1800246	SEMI-ANNUAL CENTRIFUGE PM SERVICE	MAINT
4/1/2018	1800247	Quarterly Area 3 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2018	1800248	Quarterly Area 1 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2018	1800249	Quarterly Area 2 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2018	1800250	Quarterly Area 4 HACH Filter Turbidity Analyzers Calibration	OPER
4/1/2018	1800251	QUARTERLY DEHUMIDIFIER MECHANICAL / ELECTRICAL PM	MAINT
4/1/2018	1800252	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 8	MAINT
4/1/2018	1800253	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 17	MAINT

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
4/1/2018	1800254	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 28	MAINT
4/1/2018	1800255	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 37	MAINT
4/1/2018	1800256	SEMI-ANNUAL HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
4/1/2018	1800257	SEMI-ANNUAL LOW LIFT PUMP PM	MAINT
4/1/2018	1800258	Quarterly Filter Inspection to the Gas-Fired Heaters	MAINT
4/1/2018	1800259	Quarterly Chlorinator & Chlorinator V Notch Plug PM	MAINT
4/1/2018	1800260	Quarterly HACH Turbidity Calibration	OPER
4/1/2018	1800261	Quarterly Backwash Pump Lube PM	MAINT
4/1/2018	1800262	QUARTERLY PM WASH ALL WINDOWS IN THE FILTER GALLERY	OPER
4/1/2018	1800263	QUARTERLY PM WASH ALL WINDOWS IN LOW LIFT PUMP ROOM	MAINT
4/1/2018	1800265	SEMI-ANNUAL LOW LIFT PUMP / MOTOR LUBE PM	MAINT
4/1/2018	1800266	ANNUAL LOW LIFT PUMP / MOTOR & ELECTRICAL SERVICE	MAINT
4/1/2018	1800267	Quarterly HF Turbidity Analyzer Calibration	OPER
4/1/2018	1800268	Annual Basin Sluice Gate PM	MAINT
4/1/2018	1800269	ANNUAL DRINKING WATER FOUNTAIN PM	MAINT
4/2/2018	1800270	Annual Flocculator Oil & Grease PM -North	MAINT
4/2/2018	1800271	Annual Flocculator Oil & Grease PM - South	MAINT
4/1/2018	1800295	Monthly Portable Gas Detector Calibrations	MAINT
4/1/2018	1800297	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
4/1/2018	1800302	MONTHLY PM - CENTRIFUGE MANUFACTURER RECOMMENDED	MAINT
4/1/2018	1800303	Monthly Massachusetts Ave. Pumping Station Operator PM	OPER
4/2/2018	1800311	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
4/2/2018	1800320	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
4/9/2018	1800325	WEEKLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
4/9/2018	1800326	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
4/9/2018	1800332	MONTHLY WATER PLANT BUILDING INSPECTIONS (WEEK 1 - MAIN OFFICES & ENGINEERING)	MAINT
4/16/2018	1800348	MONTHLY WATER PLANT BUILDING INSPECTIONS (WEEK 2 - BALCONY & BALCONY GENERATOR/SWITCHGEAR ROOM)	MAINT
4/23/2018	1800370	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
4/30/2018	1800405	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
4/30/2018	1800406	Weekly Chlorine Gas Detector PM	OPER
4/30/2018	1800408	WEEKLY HOUSEKEEPING - FILTER PLANT	MAINT
4/30/2018	1800410	WEEKLY HACH TURBIDITY ANALYZER SERVICE	OPER

## 5/2018

5/1/2018	1800353	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 9	MAINT
----------	---------	--	-------

# BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
5/1/2018	1800354	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 18	MAINT
5/1/2018	1800355	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 29	MAINT
5/1/2018	1800356	ANNUAL WATER FILTER \ CORE MEDIA INSPECTION \ FILTER NO 38	MAINT
5/1/2018	1800358	YEARLY HALOGEN RE-CERTIFICATION	MAINT
5/1/2018	1800359	Thickener Annual Spur Gear PM	MAINT
5/1/2018	1800360	ANNUAL EXERCISE 90" FINISHED WATER CONDUIT VALVES	MAINT
5/1/2018	1800361	QUARTERLY EMERGENCY LIGHT TESTING	MAINT
5/1/2018	1800362	YEARLY HALOGEN RE-CERTIFICATION	MAINT
5/1/2018	1800363	YEARLY HALOGEN RE-CERTIFICATION	MAINT
5/1/2018	1800380	Monthly Generator Inspection and Manual Test - Old and Remote Stations	MAINT
5/1/2018	1800381	MONTHLY AIR COMPRESSOR SERVICE	MAINT
5/1/2018	1800382	MONTHLY EMERGENCY LIGHT TESTING	MAINT
5/1/2018	1800383	MONTHLY HIGH SERVICE P4, P5, P6 INSPECTION	MAINT
5/1/2018	1800384	Monthly Lab Finished Water Chlorine Analyzer Calibration	OPER
5/1/2018	1800386	Monthly Visual Inspection of Fire Extinguishers	MAINT
5/1/2018	1800392	MONTHLY SAMPLE COLLECTION - PERFORMED BY TEST AMERICA	LAB
5/1/2018	1800393	MONTHLY BAR SCREEN INSPECTION	MAINT
5/1/2018	1800395	MONTHLY BUILDING INSPECTION	MAINT
5/1/2018	1800396	MONTHLY LOW LIFT PUMP INSPECTION	MAINT
5/1/2018	1800397	MONTHLY HVAC INSPECTION (heaters)	MAINT
5/7/2018	1800420	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
5/7/2018	1800421	Weekly Chlorine Gas Detector PM	OPER
5/7/2018	1800422	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
5/7/2018	1800423	WEEKLY HOUSEKEEPING - FILTER PLANT	MAINT
5/7/2018	1800425	WEEKLY HACH TURBIDITY ANALYZER SERVICE	OPER
5/14/2018	1800431	WEEKLY INSPECTION OF KENSINGTON, HANCOCK & FERRY TOWERS	MAINT
5/14/2018	1800434	BI-WEEKLY HVAC INSPECTION (air conditioners)	MAINT
5/14/2018	1800436	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
5/14/2018	1800438	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT
5/14/2018	1800441	WEEKLY HACH TURBIDITY ANALYZER SERVICE	OPER
5/14/2018	1800445	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
5/28/2018	1800497	WEEKLY HOUSEKEEPING - FILTER PLANT	MAINT

## 6/2018

6/1/2018	1800461	QUARTERLY DEHUMIDIFIER ELECTRICAL INSPECTION	MAINT
6/1/2018	1800462	QUARTERLY PM CLEAN FILTER CONTROL TABLES	OPER
6/1/2018	1800464	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 30	MAINT
6/1/2018	1800465	ANNUAL WATER FILTER CORE MEDIA INSPECTION \ FILTER NO 10	MAINT
6/1/2018	1800466	Semi-Annual High Voltage Glove Checks	MAINT
6/1/2018	1800467	Annual Chlorine Equipment Checks	MAINT



## BUFFALO WO AGING REPORT

<u>WO REQUIRED DATE</u>	<u>WORK ORDER NO</u>	<u>WORK DESC</u>	<u>LEAD CREW</u>
6/1/2018	1800468	YEARLY HALOGEN RE-CERTIFICATION	MAINT
6/1/2018	1800474	Monthly Portable Gas Detector Calibrations	MAINT
6/1/2018	1800483	Monthly Massachusetts Ave. Pumping Station Operator PM	OPER
6/1/2018	1800484	MONTHLY BUILDING INSPECTION	MAINT
6/1/2018	1800485	MONTHLY LOW LIFT PUMP INSPECTION	MAINT
6/4/2018	1800509	WEEKLY PM - CHECK SUMP PUMPS FOR CORRECT OPERATION	MAINT
6/11/2018	1800534	WEEKLY MASS AVE. HIGH SERVICE PUMP PM	OPER
6/18/2018	1800541	Weekly Chlorine Gas Detector PM	OPER
6/18/2018	1800545	WEEKLY HACH TURBIDITY ANALYZER SERVICE	OPER
6/25/2018	1800581	WEEKLY INSPECTION OF EYEWASH STATIONS	MAINT

---



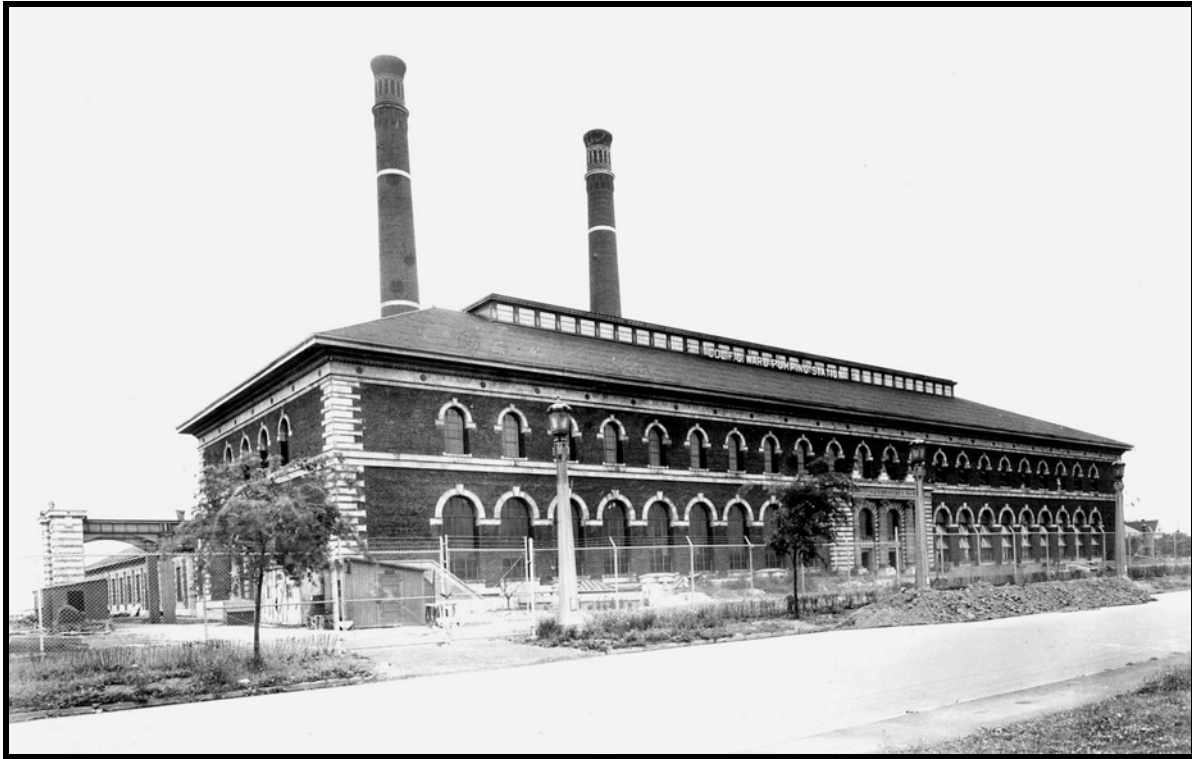
Pipe Repair Work Order ID	Pipe ID	Date Planned	Location	Cross Street	Maintenance Type
1530195331	P_37119	6/29/2018	Weimar St	Griswold St	SERVICE

Hydrant Repair Work Order ID	Hydrant ID	Date Planned	Location	Cross Street	Maintenance type
1526571685	13A-0064	5/17/2018	Gittere St	Sycamore St	HYDRANT REPLACEMENT

Valve Repair Work Order ID	Valve ID	Date Planned	Location	Cross Street	Maintenance type
1310477597	V_3898	7/12/2011	West Ave	Forest Ave	REPAIR
1312809420		8/8/2011	Niagara St		REPAIR
1313450534	V_11272	8/15/2011	E Parade Ave	N Parade Ave	REPAIR
1317839825	V_4816	10/5/2011	Grant St	AMHERST ST	REPAIR
1319202407	V_3544	10/21/2011	Dart St	Letchworth St	REPAIR
1319284135	V_19353	10/22/2011	Sherman St	Howard St	REPAIR
1321660137	V_7475	11/18/2011	SOUTH ST	Louisiana St	REPAIR
1329630897	V_420	2/19/2012	Military Rd		REPAIR
1330285966	V_19408	2/26/2012	Oneida St	Lord St	REPAIR
1332496925	V_23780_S	3/23/2012	Fillmore Ave	Best St	REPAIR
1369054573	V_18102_H	5/20/2013	Ohio St	Chicago St	REPAIR
1376574034	V_5362	8/15/2013	Parkside Ave	Florence Ave	REPAIR
1381239434	V_19511	10/8/2013	James St	Lord St	REPAIR
1391874340	V_14074	2/8/2014	Washington St	E Tupper St	REPAIR
1400857853	V_3557	5/23/2014	Letchworth St	Grant St	REPAIR
1406285702	V_18039	7/25/2014	Swan St	Elm St	REPAIR
1408918200	V_15526	8/22/2014	Kensington Expy N Se	Grey St	REPAIR
1417544108	V_17086	12/2/2014	Broadway St	Quincy St	REPLACE
1419331578	V_21595_S	12/23/2014	Archer Ave	Littell Ave	REPAIR
1419962716	V_2035	12/30/2014	Saint Lawrence Ave	Virgil Ave	REPLACE
1423743013	V_11871_H	2/12/2015	Doat St	Rustic Pl	REPAIR
1428338808	V_7621	4/6/2015	SOUTH ST	Vandalia St	REPAIR
1431095510	V_8250	5/8/2015	W Delavan Ave	Dewitt St	REPAIR
1432751135	V_12621	5/27/2015	Lang Ave	BAILEY AVE	REPAIR
1437996562	V_10924	7/27/2015	Northland Ave	Fillmore Ave	REPAIR
1439406584	V_1752	8/12/2015	Great Arrow Ave	DELAWARE	REPAIR
1448897159	V_13769	11/30/2015	MAIN ST	ALLEN ST	REPAIR
1460729271	V_2781_H	4/15/2016	William Price Memorial Pkwy	Amherst St	REPLACE
1463387131	V_10746	5/16/2016	Main Cir	Harvard Pl	REPAIR
1463542305	V_23073	5/18/2016	S Park Ave	Botanical Dr	REPAIR
1469738299	V_19531	7/28/2016	Jefferson Ave	Clinton St	REPLACE
1470228777	V_12739_S	8/3/2016	WALDEN AVE	Lathrop St	REPLACE
1470671601	V_19694	8/8/2016	Clinton St	Cedar St	REPLACE
1470672560	V_19392	8/8/2016	Clinton St	Madison St	REPLACE
1475760701	V_3773	10/6/2016	Elmwood Ave	FOREST AVE	REPAIR
1480430516	V_6560	11/29/2016	Olympic Ave	Langmeyer Ave	REPAIR
1480431421	V_6447	11/29/2016	Langmeyer Ave	Olympic Ave	REPAIR
1481046506	V_8320	12/6/2016	Elmwood Ave	W DELAVAN AVE	REPAIR
1484140020	V_3747	1/11/2017	Rees St	Letchworth St	REPAIR
1487765434	V_20314_H	2/22/2017	Spring St	Mary B Talbert Blvd	REPAIR
1488844615	V_14702	3/6/2017	Jersey St	DAR Dr	REPAIR
1488844362	V_4855	3/6/2017	Tonawanda St	West Ave	REPAIR
1489447240	V_13981	3/13/2017	Goodell St	Oak St	REPAIR
1490918792	V_17230	3/31/2017	BAILEY AVE	PULLMAN AVE	REPAIR
1490964064	V_3363	3/31/2017	Bailey Ave	WINSPEAR AVE	REPAIR
1491207802	V_7105	4/3/2017	Bailey Ave	KENSINGTON AVE	REPAIR
1498213134	V_13709	6/23/2017	Allen St	Elmwood Ave	REPAIR
1500282731	V_22794	7/17/2017	Elk St	Dole St	REPAIR
1500664638	V_21587	7/21/2017	Perry Blvd	MILTON	REPAIR
1501752343	V_3662	8/3/2017	GRANT ST	Military Rd	REPAIR
1502467553	V_3114	8/11/2017	HERTEL AVE	Carmel Rd	REPAIR
1502804930	V_15893	8/15/2017	Paderewski Dr	Clark St	REPAIR
1503342478	V_3125	8/21/2017	STARIN	Taunton Pl	REPAIR
1504023225	V_15895	8/29/2017	Peckham St	Sears St	REPAIR
1505341669	V_9308	9/13/2017	Delaware Ave	Summer St	REPAIR
1505928908	V_4797	9/20/2017	AMHERST ST	Military Rd	REPAIR
1505927644	V_4814	9/20/2017	AMHERST ST	Grant St	REPAIR

1506691659	V_18362	9/29/2017	Clinton St	Washington St	REPLACE
Valve Repair Work Order ID	Valve ID	Date Planned	Location	Cross Street	Maintenance type
1508318955	V_9877	10/18/2017	W DELAVAN AVE	Chapin Pkwy	REPLACE
1508318717	V_8336	10/18/2017	W Delavan Ave	Chapin Pkwy	REPAIR
1508413343	V_9878	10/19/2017	W DELAVAN AVE	Delaware Ave	REPAIR
1508503076	V_27136	10/20/2017	Main St	W Delavan Ave	REPAIR
1509691891	V_9815	11/3/2017	Delaware Ave	Bryant St	REPAIR
1509691725	V_9057	11/3/2017	Delaware Ave	Bryant St	REPAIR
1512126018	V_7084	12/1/2017	Manhattan Ave	Shawnee Ave	REPAIR
1513693205	V_11341	12/19/2017	Best St	Masten Ave	REPLACE
1513783507	V_27059	12/20/2017	Parkridge Ave	Berkshire Ave	REPAIR
1513868302	V_15056	12/21/2017	Sherman St	Genesee St	REPAIR
1514551068		12/29/2017	Schuele Ave	Northland Ave	REPLACE
1518768360	V_12157	2/16/2018	MOSELLE ST	WALDEN AVE	REPLACE
1520943104	V_27201_H	3/13/2018	Mildred St	Tyler St	REPLACE
1521216824	V_16915_H	3/16/2018	Chauncey St	Bailey Ave	REPAIR
1521216569	V_17475	3/16/2018	Chauncey St	Bailey Ave	REPAIR
1523000837	V_27232_H	4/6/2018	Moreland St	E Lovejoy St	REPLACE
1523285151	V_9847	4/9/2018	Busti Ave	Massachusetts Ave	REPLACE
1523633778	V_8976	4/13/2018	W Utica St	Ashland Ave	REPLACE
1523634036	V_8506	4/13/2018	W Utica St	Rhode Island St	REPLACE
1524038308	V_9022	4/18/2018	W Utica St	Delaware Ave	REPAIR
1524148971	V_480	4/19/2018	Military Rd	SAYRE ST	REPAIR
1524818644	V_18827	4/27/2018	ELM ST	CLINTON ST	REPAIR
1526481272	V_19405	5/16/2018	MONTGOMERY ST	HOWARD ST	REPLACE
1526559288	V_18887	5/17/2018	COIT ST	HOWARD ST	REPAIR
1526559427	V_19404	5/17/2018	HOWARD ST	MONTGOMERY ST	REPLACE
1527760479	V_27263_H	5/31/2018	Gittere St	Sycamore St	REPLACE

# Annual Water Audit Report



***VEOLIA NORTH AMERICA,  
BUFFALO PROJECT  
ANNUAL WATER AUDIT REPORT***

***Contract Year 7 Ending June 30, 2017***

**Buffalo Water Board**

<b>Chairperson:</b>	Oluwole McFoy, P.E.
<b>Member:</b>	Gerald E. Kelly
<b>Member:</b>	William L. Sunderlin
<b>Member:</b>	Michael Finn, P.E.

**City of Buffalo**

**Commissioner of Public Works, Parks & Streets**  
Steven Stepniak

**City Engineer**  
Michael Finn, P.E.

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION</b>	<b>2</b>
<b>2.0 WATER AUDIT METHODOLOGY</b>	<b>3</b>
<b>3.0 AUDIT RESULTS</b>	<b>4</b>
<b>4.0 CONCLUSIONS &amp; RECOMMENDATIONS</b>	<b>9</b>

## 1.0 INTRODUCTION

### 1.1 System Description

The water infrastructure within the City of Buffalo was largely developed over the past century. The City's approximately nine hundred ten mile piping network (mains and hydrant laterals) is predominantly comprised of cast iron pipe (CI) with lesser quantities of ductile iron pipe (DIP), pre-stressed concrete cylinder pipe (PCCP), polyvinyl chloride (PVC) and high density polyethylene pipe (HDPE). There are approximately 21,700 valves (not including domestic and fire line valves) and 7,960 hydrants (not including private hydrants).

It is the goal of Veolia North America (Veolia) to provide Buffalo Water with a workable document which will provide operational accountability by auditing supplies and implementing methodologies to identify system loss and to provide cost effective solutions to decrease and, over time, minimize system loss. It must be understood that such a document evolves over time in a water system such as Buffalo. Informational data, including that of metering and billing require validation through a credible metering program. Validation of user information is also an important factor in developing a truly workable document.

Water loss equates to revenue loss, and is incurred not only from pipeline leakage but also when water consumption is not properly metered and billed. Estimated usage does not provide an accurate depiction of actual water usage; therefore, actual reads are obtained whenever possible.

Billing process improvements continue to yield favorable results as seen in overall billing and collection performance. Due to a very transient workforce in the billing and customer service offices, ongoing training programs are in place to ensure employees learn current technologies and processes in order to maintain efficient operations.

This report was developed in concurrence with benchmarks established by the American Water Works Association (AWWA) and the International Water Association (IWA). Additional data has been derived from the Geographic Information System (GIS) based InfoNet asset management tool developed by Veolia for the City of Buffalo. InfoNet continues to progress as personnel have been trained to update the GIS database with daily changes, utilize mobile technology to capture maintenance history and use the mapping functionality to locate asset information. Furthermore, the City of Buffalo Engineering Department in conjunction with City retained consultants has updated the GIS database with additional asset information as well as work performed through Capital Projects.

Initiatives to reduce water loss are a priority to Veolia and Buffalo Water. Veolia has successfully implemented initiatives, and continues to further identify solutions for system inefficiencies including improvements to meter reading, billing processes and overall system operation. Effective technologies were introduced by Veolia to enable true and actual meter readings. GIS mapping was developed with coordinates entered into the Neptune meter reading software and the GIS database. This provides structure and sequence to the reading routes which were established based on time to read technology. We are confident that all working meters in quarterly billing cycles are being read electronically and accurately. Remaining are approximately 3,000 meters that require repair and or replacement.



## 2.0 WATER AUDIT METHODOLOGY

In order to create an “Annual Water Audit” most applicable to the City of Buffalo, Veolia utilized the methodology supported by the American Water Works Association (AWWA). This methodology defines the most common forms of water consumption and water loss for drinking water utilities across the world (see Figure 1). The AWWA Water Loss Control Committee (WLCC) issued the “Free Water Audit Software v5.0”, which is used for this study.

The methodology consists of:

1. Quantifying total system input volume
2. Calculating Authorized Consumption
3. Determining Water Losses
  - Apparent Losses
  - Real Losses
4. Determining System Data
5. Quantify Cost Data
6. Performance Indicators – automatically calculated from previous data entered
  - Financial indicators
  - Operational Efficiency Indicators

**FIGURE 1 - WATER AUDIT COMPONENTS**

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption (including water exported)	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non-Revenue Water (NRW)
			Unbilled Unmetered Consumption	
	Water Losses	Apparent Losses	Unauthorized Consumption	
			Customer Metering Inaccuracies	
			Systematic Data Handling Errors	
		Real Losses	Leakage on Transmission and Distribution Mains	
			Leakage and Overflows at Utility's Storage Tanks	
			Leakage on Service Connections up to point of Customer metering	

### 3.0 AUDIT RESULTS

FIGURE 2 - SUMMARY OF AUDIT RESULTS

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.  
Copyright © 2014. All Rights Reserved.

<div> <div>Water Audit Report for:</div> <div>Buffalo Water (NY 0000422)</div> </div> <div> <div>Reporting Year:</div> <div>7</div> <div>7/2016 - 6/2017</div> </div> <div> <div>Data Validity Score:</div> <div>63</div> </div>							
<div>Own Sources</div> <div>(Adjusted for known errors)</div> <div>24,944.384</div>	<div>System Input</div> <div>24,944.384</div>	<div>Water Exported</div> <div>21.109</div>	<div>Billed Water Exported</div>			<div>Revenue Water</div> <div>21.109</div>	
		<div>Water Supplied</div> <div>24,923.275</div>	<div>Authorized Consumption</div> <div>14,372.052</div>	<div>Billed Authorized Consumption</div> <div>8,961.027</div>	<div>Billed Metered Consumption (water exported is removed)</div> <div>8,209.018</div>	<div>Revenue Water</div>	
				<div>Billed Unmetered Consumption</div> <div>752.009</div>		<div>8,961.027</div>	
			<div>Water Losses</div> <div>10,551.223</div>	<div>Unbilled Authorized Consumption</div> <div>5,411.025</div>	<div>Unbilled Metered Consumption</div> <div>401.775</div>	<div>Non-Revenue Water (NRW)</div>	
					<div>Unbilled Unmetered Consumption</div> <div>5,009.250</div>		<div>15,962.248</div>
		<div>Water Imported</div> <div>0.000</div>	<div>Water Supplied</div> <div>24,923.275</div>	<div>Apparent Losses</div> <div>536.030</div>	<div>Unauthorized Consumption</div> <div>62.308</div>	<div>15,962.248</div>	
					<div>Customer Metering Inaccuracies</div> <div>453.200</div>		
					<div>Systematic Data Handling Errors</div> <div>20.523</div>		
					<div>Real Losses</div> <div>10,015.192</div>		<div>Leakage on Transmission and/or Distribution Mains</div> <div>Not broken down</div>
		<div>Leakage and Overflows at Utility's Storage Tanks</div> <div>Not broken down</div>					
<div>Leakage on Service Connections</div> <div>Not broken down</div>							

Note: Table taken from AWWA Water Loss Control Committee (WLCC) Free Water Audit Software v5.0, values in million gallons (MG).

### 3.1 SYSTEM INPUT VOLUME (CORRECTED FOR KNOWN ERRORS)

**TABLE 1 - MONTHLY SYSTEM SUPPLY**

	Month	Total System Supply (gallons)	Total System Supply (BG)
2016	JUL	2,169,559,000	2.1696
	AUG	2,194,146,000	2.1941
	SEP	1,979,745,000	1.9797
	OCT	1,998,156,000	1.9982
	NOV	1,814,204,000	1.8142
	DEC	1,904,416,000	1.9044
2017	JAN	2,247,032,000	2.2470
	FEB	2,042,751,760	2.0428
	MAR	2,161,994,000	2.1620
	APR	2,067,682,000	2.0677
	MAY	2,049,005,000	2.0490
	JUN	2,066,249,000	2.0662
	<b>TOTALS</b>	<b>24,694,939,760</b>	<b>24.6949</b>

Total measured system supply for Contract Year 7 (CY7) was 24.69 billion gallons (BG).

**TABLE 2 - ADJUSTED TOTAL WATER SUPPLIED**

WATER SUPPLIED		
Volume from own sources:	24,694	MG/Yr
Master meter error adjustment:	1.0%	under-registered
Water Exported:	21.32	MG/Yr
Water Supplied:	24,923	MG/Yr

Adjusted total water supplied was 24,923 MG/Yr for CY7.

### 3.2 AUTHORIZED CONSUMPTION VS. WATER LOSSES

- 3.2.1 *Authorized Consumption* = billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption  
 Authorized consumption includes items such as retail customer consumption, fire fighting and training, flushing of mains, water used for sewer and street cleaning, watering of municipal gardens, City fountains, splash pads and pools, etc. Authorized consumption includes both metered and unmetered usage.

**TABLE 3 - TOTAL AUTHORIZED CONSUMPTION**

AUTHORIZED CONSUMPTION		
Billed metered:	8,209.018	MG/Yr
Billed unmetered:	752.009	MG/Yr
Unbilled metered:	401.775	MG/Yr
Unbilled unmetered:	5,009.250	MG/Yr
<b>TOTAL:</b>	<b>14,372.052</b>	<b>MG/Yr</b>

### 3.2.2 Billed Authorized Consumption (Revenue Water)

3.2.2.1 *Billed Meter Consumption* - All metered consumption which is billed. This includes all groups of customers. The metered consumption data was taken directly from billing records for the water audit period. The accuracy of metered consumption data will be refined as customer information is corrected and we begin to receive true reads as a result of the residential and large meter program changeouts.

3.2.2.2 *Billed Unmetered Consumption* - All billed consumption which is calculated based on estimates or norms but is not metered. This accounts for a considerable volume as approximately 12% of Buffalo's residential accounts remain unmetered (flat accounts).

### 3.2.3 Unbilled Authorized Consumption (Non-Revenue Water) - All consumption that is unbilled, but authorized by the City.

3.2.3.1 *Unbilled Metered Consumption* - Metered consumption which is for any reason unbilled. This includes metered consumption of the City itself and water provided to institutions free of charge. This is water used at City owned properties including parks.

3.2.3.2 *Unbilled Unmetered Consumption* - Any kind of authorized consumption which is neither billed nor metered including water used for fire fighting, hydrant flow testing, process water at filtration plant, the flushing of mains and sewers, street cleaning, festivals, parks and recreational purposes. There are many sub-components of water use which can be difficult to identify and quantify. .

### 3.3 WATER LOSSES (NON-REVENUE WATER)

*Water losses (non-revenue water)* = apparent losses + real losses. Water losses are also considered the difference between System Input and Authorized Consumption. Water losses were based on the total volume for the whole system.

**TABLE 4 - SUMMARY OF WATER LOSSES DURING CY7**

<b>WATER LOSSES</b>		
(Water Supplied - Authorized Consumption):	10,551.223	MG/Yr
<b>APPARENT LOSSES</b>		
Unauthorized consumption:	62.308	MG/Yr
Customer metering inaccuracies:	453.200	MG/Yr
Systematic data handling errors:	20.523	MG/Yr
<b>TOTAL APPARENT LOSSES:</b>	536.030	MG/Yr
<b>REAL LOSSES (Current Annual Real Losses)</b>		
Real Losses = Water Losses - Apparent Losses:	10,015.192	MG/Yr

### 3.3.1 *Apparent Losses*

*Apparent Losses* = unauthorized consumption + meter under-registration + data handling errors. This includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorized consumption (theft or illegal use).

3.3.1.1 *Unauthorized Consumption* – Includes water illegally withdrawn from hydrants, illegal connections, open bypasses around consumption meters or meter reading equipment tampering. While this component has a direct impact on revenue, it is assumed that the volume is low in Buffalo based on observations during our ongoing meter maintenance program.

3.3.1.2 *Customer Metering Inaccuracies* - Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters will wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register. Customer metering inaccuracies were estimated using a value of 5% of total metered consumption. Results from Veolia meter tests will continue to provide a better understanding of uncertainties associated with different meter classes going forward. Findings thus far continue to indicate a relatively healthy small meter population, although lower flows are beginning to deteriorate, that emphasizes the importance in establishing a large meter test program.

3.3.1.3 *Systematic Data Handling Errors* - Apparent water losses caused by systematic data handling errors in the meter reading and billing system. This component of the water audit is the most difficult to estimate.

3.3.2 *Real Losses* - Physical water losses from the system, includes storage tank turnover, and lateral leaks from the main tap to the customer meter or first point of use for unmetered properties. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.

3.3.2.1 *Leakage And Overflows at Utility's Storage Tanks*- The improved pumping schemes and standard pumping procedures that were implemented resulted in a more proficient pumping operation. Storage tanks are better utilized to buffer pressure differentials minimizing dumping and eliminating overflow. Storage tanks are emptied and filled to improve water quality if chlorine residuals are low. Five tank volumes are estimated to be lost from each remote tank site during CY7.

TABLE 5 - ESTIMATED WATER LOSS AT REMOTE SITES

REMOTE SITE	CAPACITY (gallons)	ESTIMATED LOSS (MG)
Hancock Tower	2,000,000	10
Kensington Tower*	790,000	Out of Service
Manhattan Storage Tank	5,000,000	25
Grover Cleveland Storage Tank	250,000	1.25
Ferry Tank	2,000,000	10
<b>TOTAL:</b>	<b>9,250,000*</b>	<b>46.25</b>

\*Note: Kensington was retired from service in mid-2014 and is not included in the total capacity estimate.

#### 3.3.2.2 Leakage On Transmission, Distribution Mains and Service Connections

The amount of water lost due to leaks on mains and service connections was calculated based on the difference between the total Real Losses and the losses due to water quality turnover at the remote tank locations.

This resulted in an estimate of about 9,968.942 BG/Yr.

#### 3.4 COSTS ASSOCIATED TO WATER LOSSES

Once all losses, revenue and non-revenue water, were quantified, we were able to determine the costs associated with each type of loss. The annual cost for CY7 to produce and operate the Buffalo Water system was \$57,587,667 (see Table 6). "Apparent Loss" costs are calculated based on \$2.28/100 cubic feet of lost water. During CY7, it was determined about \$1,633,776 were lost as a result of "Apparent Losses." For every one million gallons of water produced, it costs about \$2,332. This cost is applied towards the "Real Losses" to estimate the amount of lost annual operating costs associated with the real losses, which totaled \$23,359,134 in CY7.

The "Operational Efficiency Indicators" in Table 6 are benchmarks we will use for each contract year moving forward with a focus on reducing the amounts associated with Unavoidable Annual Real Losses (UARL) and Current Annual Real Losses (CARL). As a result, the Infrastructure Leak Index (ILI) ratio should decrease. For CY7, the ILI for the system was 27.61, which is a decrease from 31.22 during CY6.



**TABLE 6 - ANNUAL SUMMARY OF COSTS FOR SYSTEM OPERATIONS AND LOSSES IN CY7.**

<b>COST DATA</b>		
Total annual cost of operating water system:	\$57,597,667	\$/Year
Customer retail unit cost (applied to Apparent Losses):	\$2.28	\$/100 cubic feet
Variable production cost (applied to Real Losses):	\$2,332.37	\$/Million gallons
<b>PERFORMANCE INDICATORS</b>		
<b>Financial Indicators:</b>		
Non-revenue water as % by volume of Water Supplied:	64.0%	
Non-revenue water as percent by cost of operating system:	65.3%	
Annual cost of Apparent Losses:	\$1,633,776	
Annual cost of Real Losses:	\$23,359,134	
<b>Operational Efficiency Indicators:</b>		
Apparent Losses per service connection per day:	15.64	gals/connection/day
Real Losses per service connection per day:	292.27	gals/connection/day
Real Losses per service connection per day/psi pressure:	7.13	gals/conn./day/psi
Unavoidable Annual Real Losses (UARL):	362.70	MG/Yr
Current Annual Real Losses (CARL):	10,015.19	MG/Yr
Infrastructure Leakage Index (ILI) [CARL/UARL]:	27.61	

## 4.0 CONCLUSIONS & RECOMMENDATIONS

### 4.1 CONCLUSIONS

The primary effort in creating this report was to glean data from a more reliable and more accurate base. Similar to previous years, we continued our focus on correcting the customer information system database. Continued initiatives included site visits to determine and eliminate razed properties from the active billing ledger, as well as replacing all small non-Neptune meters with new meters. Efforts to minimize estimated reads are proving successful; with billed estimated usage at approximately 4% in CY7. At this time there is not an initiative in place utilizing contract labor to address unmetered accounts; however, personnel install meters whenever possible. A comprehensive meter installation program utilizing contract labor has been prepared by Veolia for Buffalo Water's consideration.

Meter testing conducted by Veolia during CY5 noted that approximately 2,000 Neptune meters manufactured between 2006 through 2007 that are currently installed in the distribution system were found to be faulty, resulting in reduced accuracy and likely under-registering flow to metered accounts. During CY7, approximately 1,000 of the meters were replaced by Neptune, and the remainder will be replaced by City personnel.

Veolia has previously developed, and is prepared to implement unidirectional flushing, comprehensive leak detection surveys and valve exercise/maintenance programs in CY8 depending on personnel levels. These programs should be implemented in 2018 and maintained moving forward. Veolia will continue to improve the overall condition of the meter inventory and facilitate distribution system improvements.



#### 4.2 VEOLIA SERVICE, VALUE AND RESPONSIBILITY.

Each year, this report reflects considerable improvements in the meter reading accuracies and the utility billing system as compared to the previous year. As meters are upgraded and read routinely, information will continue to become more reliable and more useful. Theft of service becomes less and less of an issue as usage is monitored. We are also aware that customers are more willing to expeditiously pay when their bill is based on actual usage. The clerical process of correcting and updating customer information must be permitted to continue.

The continued development of the GIS based InfoNet for the distribution system provides accurate underground asset inventory for use in field operations during distribution system maintenance. Utilizing Global Positioning System (GPS) units, Veolia and Buffalo Water are committed to improving this inventory with increased accurate and comprehensive information. Our commitment to underground asset management in Buffalo will provide more reliable and accurate data collection and will facilitate a more proficient workforce.

#### 4.3 RECOMMENDATIONS

Veolia recommends that Buffalo Water continues to provide support for Veolia's initiatives and solutions to reduce overall water loss. Unmetered or estimated water use equates to lost revenue and inequitable billing practices. Water lost through leaks often result in disruption of service, excessive overtime costs and a fatigued work force. If leaks were identified and repaired before they became health and safety issues, water and revenue loss could be minimized. Valve maintenance is important in minimizing loss as broken or closed valves reduce system flows and balance that may also result in main breaks.

Similar to previous years, Veolia's recommendations again include:

- Implementation of a unidirectional flushing program.
- Implementation of a comprehensive leak detection program.
- Further implementation of a comprehensive valve maintenance program.
- All Neptune meters that are not being read for any variety of reasons are retrofitted with radio type registers.
- A flat to meter program be established to eliminate unmetered usage.
- Continued change-out of known faulty Neptune meters currently installed in the distribution system that were manufactured between 2006 through 2007 (approximately 1,000 remaining) in order to maximize revenue capture.

Veolia offers the expertise and experience to deliver result-driven solutions to maximize efficiency and ensure sustainability for generations to come.

# Status of System Energy Usage

## CY 8 - Electricity Usage

facility_building	account_number	start	end	kWh	commodity	utility	fee	Total	Fiscal Yr
02-0001 Jersey St	7575112101	6/20/2017	7/20/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	7/20/2017	8/21/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	8/21/2017	9/19/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	9/19/2017	10/18/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	10/18/2017	11/17/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	11/17/2017	12/19/2017	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	12/19/2017	1/19/2018	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	1/19/2018	2/16/2018	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	2/16/2018	3/20/2018	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	3/20/2018	4/19/2018	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	4/19/2018	5/21/2018	0	\$0.00	\$21.67	\$0.00	\$21.67	17-18
02-0001 Jersey St	7575112101	5/21/2018	6/20/2018	0	\$0.00	\$21.25	\$3.58	\$24.83	17-18
02-0003 770 E Ferry St	6915112100	6/23/2017	7/25/2017	25	\$1.22	\$23.36	\$0.01	\$24.59	17-18
02-0003 770 E Ferry St	6915112100	7/25/2017	8/24/2017	25	\$1.06	\$23.36	\$0.01	\$24.43	17-18
02-0003 770 E Ferry St	6915112100	8/24/2017	9/22/2017	25	\$0.84	\$23.38	\$0.01	\$24.23	17-18
02-0003 770 E Ferry St	6915112100	9/22/2017	10/23/2017	25	\$0.92	\$23.36	\$0.01	\$24.29	17-18
02-0003 770 E Ferry St	6915112100	10/23/2017	11/22/2017	25	\$0.88	\$23.37	\$0.01	\$24.26	17-18
02-0003 770 E Ferry St	6915112100	11/22/2017	12/22/2017	25	\$0.90	\$23.36	\$0.01	\$24.27	17-18
02-0003 770 E Ferry St	6915112100	12/22/2017	1/24/2018	25	\$1.99	\$23.39	\$0.01	\$25.39	17-18
02-0003 770 E Ferry St	6915112100	1/24/2018	2/22/2018	25	\$0.93	\$23.33	\$0.01	\$24.27	17-18
02-0003 770 E Ferry St	6915112100	2/22/2018	3/23/2018	25	\$0.80	\$23.36	\$0.01	\$24.17	17-18
02-0003 770 E Ferry St	6915112100	3/23/2018	4/24/2018	25	\$0.96	\$23.31	\$0.01	\$24.28	17-18
02-0003 770 E Ferry St	6915112100	4/24/2018	5/24/2018	25	\$0.88	\$23.29	\$0.00	\$24.17	17-18
02-0003 770 E Ferry St	6915112100	5/24/2018	6/25/2018	25	\$1.24	\$22.84	\$3.48	\$27.56	17-18
02-0004 Hancock Ave Downing St	1673689105	6/21/2017	7/21/2017	15	\$0.73	\$22.68	\$0.01	\$23.42	17-18
02-0004 Hancock Ave Downing St	1673689105	7/21/2017	8/21/2017	15	\$0.64	\$22.68	\$0.01	\$23.33	17-18
02-0004 Hancock Ave Downing St	1673689105	8/21/2017	9/20/2017	15	\$0.50	\$22.69	\$0.00	\$23.19	17-18
02-0004 Hancock Ave Downing St	1673689105	9/20/2017	10/19/2017	15	\$0.58	\$22.68	\$0.00	\$23.26	17-18
02-0004 Hancock Ave Downing St	1673689105	10/19/2017	11/20/2017	15	\$0.52	\$22.69	\$0.00	\$23.21	17-18
02-0004 Hancock Ave Downing St	1673689105	11/20/2017	12/20/2017	15	\$0.54	\$22.68	\$0.00	\$23.22	17-18
02-0004 Hancock Ave Downing St	1673689105	12/20/2017	1/22/2018	15	\$1.21	\$22.69	\$0.00	\$23.90	17-18
02-0004 Hancock Ave Downing St	1673689105	1/22/2018	2/20/2018	15	\$0.56	\$22.25	\$0.00	\$22.81	17-18
02-0004 Hancock Ave Downing St	1673689105	2/20/2018	3/21/2018	15	\$0.47	\$22.27	\$0.00	\$22.74	17-18
02-0004 Hancock Ave Downing St	1673689105	3/21/2018	4/20/2018	15	\$0.56	\$22.26	\$0.00	\$22.82	17-18
02-0004 Hancock Ave Downing St	1673689105	4/20/2018	5/21/2018	15	\$0.53	\$22.22	\$0.00	\$22.75	17-18
02-0004 Hancock Ave Downing St	1673689105	5/21/2018	6/21/2018	15	\$0.75	\$22.20	\$3.59	\$26.54	17-18
02-0005 Manhattan Ave	3005135109	6/5/2017	7/5/2017	22,848	\$966.99	\$2,186.03	\$7.38	\$3,160.40	17-18
02-0005 Manhattan Ave	3005135109	7/5/2017	8/3/2017	25,728	\$1,330.37	\$2,182.96	\$9.89	\$3,523.22	17-18
02-0005 Manhattan Ave	3005135109	8/3/2017	9/5/2017	27,840	\$1,057.01	\$2,221.35	\$9.98	\$3,288.34	17-18
02-0005 Manhattan Ave	3005135109	9/5/2017	10/3/2017	25,536	\$1,037.91	\$2,178.98	\$6.68	\$3,223.57	17-18
02-0005 Manhattan Ave	3005135109	10/3/2017	11/2/2017	26,688	\$948.11	\$2,438.96	\$13.28	\$3,400.35	17-18
02-0005 Manhattan Ave	3005135109	11/2/2017	12/5/2017	8,640	\$322.32	\$2,113.79	\$2.84	\$2,438.95	17-18
02-0005 Manhattan Ave	3005135109	12/5/2017	1/4/2018	0	\$0.00	\$1,498.23	\$0.00	\$1,498.23	17-18
02-0005 Manhattan Ave	3005135109	1/4/2018	2/2/2018	0	\$0.00	\$1,307.32	\$0.00	\$1,307.32	17-18
02-0005 Manhattan Ave	3005135109	2/2/2018	3/5/2018	0	\$0.00	\$1,296.05	\$0.00	\$1,296.05	17-18
02-0005 Manhattan Ave	3005135109	3/5/2018	4/4/2018	0	\$0.00	\$1,282.29	\$0.00	\$1,282.29	17-18
02-0005 Manhattan Ave	3005135109	4/4/2018	5/3/2018	0	\$0.00	\$1,362.19	\$0.00	\$1,362.19	17-18
02-0005 Manhattan Ave	3005135109	5/3/2018	6/5/2018	0	\$0.00	\$1,329.81	\$3.58	\$1,333.39	17-18
02-0006 Porter Ave	7288660101	6/19/2017	7/19/2017	1,291,856	\$59,648.34	\$41,881.85	\$496.82	\$102,027.01	17-18
02-0006 Porter Ave	7288660101	7/19/2017	8/17/2017	1,596,417	\$73,628.81	\$45,547.09	\$572.20	\$119,748.10	17-18
02-0006 Porter Ave	7288660101	8/17/2017	9/18/2017	1,323,761	\$47,622.69	\$42,332.44	\$346.39	\$90,301.52	17-18
02-0006 Porter Ave	7288660101	9/18/2017	10/17/2017	808,601	\$33,103.09	\$33,218.46	\$402.27	\$66,723.82	17-18
02-0006 Porter Ave	7288660101	10/17/2017	11/16/2017	1,680,351	\$60,860.76	\$45,882.98	\$552.07	\$107,295.81	17-18
02-0006 Porter Ave	7288660101	11/16/2017	12/18/2017	1,891,057	\$69,560.67	\$46,301.14	\$509.17	\$116,370.98	17-18
02-0006 Porter Ave	7288660101	12/18/2017	1/18/2018	1,611,518	\$148,849.80	\$48,156.32	\$375.15	\$197,381.27	17-18
02-0006 Porter Ave	7288660101	1/18/2018	2/15/2018	1,828,623	\$72,688.70	\$44,341.24	\$509.45	\$117,539.39	17-18
02-0006 Porter Ave	7288660101	2/15/2018	3/19/2018	2,021,971	\$63,093.87	\$42,495.23	\$563.31	\$106,152.41	17-18
02-0006 Porter Ave	7288660101	3/19/2018	4/18/2018	1,885,144	\$70,009.41	\$50,955.90	\$578.68	\$121,543.99	17-18
02-0006 Porter Ave	7288660101	4/18/2018	5/17/2018	840,791	\$33,755.00	\$39,669.50	\$0.00	\$73,424.50	17-18
02-0006 Porter Ave	7288660101	5/17/2018	6/19/2018	767,389	\$38,421.41	\$37,364.27	\$280.37	\$76,066.05	17-18
02-0007 Massachusetts Ave	8128865107	6/26/2017	7/26/2017	695,323	\$34,824.61	\$16,666.86	\$267.41	\$51,758.88	17-18
02-0007 Massachusetts Ave	8128865107	7/26/2017	8/27/2017	397,277	\$16,792.82	\$12,718.16	\$142.40	\$29,653.38	17-18
02-0007 Massachusetts Ave	8128865107	8/27/2017	9/25/2017	1,052,902	\$39,916.81	\$18,834.65	\$275.51	\$59,026.97	17-18
02-0007 Massachusetts Ave	8128865107	9/25/2017	10/25/2017	908,634	\$33,860.45	\$22,014.35	\$452.04	\$56,326.84	17-18
02-0007 Massachusetts Ave	8128865107	10/25/2017	11/27/2017	234,528	\$9,598.71	\$6,641.99	\$77.05	\$16,317.75	17-18
02-0007 Massachusetts Ave	8128865107	11/27/2017	12/26/2017	602,638	\$23,763.37	\$17,036.54	\$162.26	\$40,962.17	17-18
02-0007 Massachusetts Ave	8128865107	12/26/2017	1/25/2018	428,446	\$35,753.90	\$14,543.75	\$99.74	\$50,397.39	17-18
02-0007 Massachusetts Ave	8128865107	1/25/2018	2/25/2018	314,981	\$11,872.04	\$6,043.69	\$87.75	\$18,003.48	17-18
02-0007 Massachusetts Ave	8128865107	2/25/2018	3/26/2018	245,982	\$0.00	\$5,125.72	\$0.00	\$5,125.72	17-18

02-0007 Massachusetts Ave	8128865107	3/26/2018	4/25/2018	320,694	\$12,712.78	\$12,152.34	\$0.00	\$24,865.12	17-18
02-0007 Massachusetts Ave	8128865107	4/25/2018	5/28/2018	1,576,270	\$53,827.95	\$23,916.71	\$572.14	\$78,316.80	17-18
02-0007 Massachusetts Ave	8128865107	5/28/2018	6/26/2018	1,078,221	\$51,140.46	\$18,646.67	\$271.37	\$70,058.50	17-18
02-0008 26 Bailey Ave	0911293108	6/14/2017	7/14/2017	1,630	\$71.73	\$132.81	\$0.53	\$205.07	17-18
02-0008 26 Bailey Ave	0911293108	7/14/2017	8/14/2017	1,464	\$69.49	\$120.69	\$0.56	\$190.74	17-18
02-0008 26 Bailey Ave	0911293108	8/14/2017	9/13/2017	1,004	\$35.29	\$90.23	\$0.36	\$125.88	17-18
02-0008 26 Bailey Ave	0911293108	9/13/2017	10/12/2017	950	\$37.26	\$85.77	\$0.25	\$123.28	17-18
02-0008 26 Bailey Ave	0911293108	10/12/2017	11/13/2017	669	\$23.00	\$67.21	\$0.33	\$90.54	17-18
02-0008 26 Bailey Ave	0911293108	11/13/2017	12/14/2017	865	\$31.32	\$80.32	\$0.28	\$111.92	17-18
02-0008 26 Bailey Ave	0911293108	12/14/2017	1/15/2018	1,071	\$81.42	\$95.22	\$0.29	\$176.93	17-18
02-0008 26 Bailey Ave	0911293108	1/15/2018	2/12/2018	834	\$37.89	\$76.40	\$0.19	\$114.48	17-18
02-0008 26 Bailey Ave	0911293108	2/12/2018	3/14/2018	746	\$22.44	\$71.43	\$0.21	\$94.08	17-18
02-0008 26 Bailey Ave	0911293108	3/14/2018	4/13/2018	662	\$22.84	\$66.14	\$0.20	\$89.18	17-18
02-0008 26 Bailey Ave	0911293108	4/13/2018	5/14/2018	638	\$24.75	\$62.15	\$0.00	\$86.90	17-18
02-0008 26 Bailey Ave	0911293108	5/14/2018	6/14/2018	837	\$39.88	\$74.69	\$3.88	\$118.45	17-18
02-0009 60 Joslyn Pl	1965135103	6/6/2017	7/7/2017	752	\$30.91	\$73.10	\$0.24	\$104.25	17-18
02-0009 60 Joslyn Pl	1965135103	7/7/2017	8/4/2017	707	\$37.06	\$69.49	\$0.27	\$106.82	17-18
02-0009 60 Joslyn Pl	1965135103	8/4/2017	9/6/2017	1,428	\$51.32	\$119.05	\$0.51	\$170.88	17-18
02-0009 60 Joslyn Pl	1965135103	9/6/2017	10/4/2017	735	\$28.41	\$71.28	\$0.19	\$99.88	17-18
02-0009 60 Joslyn Pl	1965135103	10/4/2017	11/3/2017	707	\$23.46	\$69.73	\$0.35	\$93.54	17-18
02-0009 60 Joslyn Pl	1965135103	11/3/2017	12/6/2017	823	\$28.79	\$77.58	\$0.27	\$106.64	17-18
02-0009 60 Joslyn Pl	1965135103	12/6/2017	1/5/2018	834	\$53.87	\$78.85	\$0.22	\$132.94	17-18
02-0009 60 Joslyn Pl	1965135103	1/5/2018	2/5/2018	849	\$49.41	\$77.88	\$0.20	\$127.49	17-18
02-0009 60 Joslyn Pl	1965135103	2/5/2018	3/6/2018	778	\$24.28	\$73.99	\$0.22	\$98.49	17-18
02-0009 60 Joslyn Pl	1965135103	3/6/2018	4/5/2018	745	\$24.61	\$73.39	\$0.23	\$98.23	17-18
02-0009 60 Joslyn Pl	1965135103	4/5/2018	5/4/2018	674	\$27.79	\$64.58	\$0.00	\$92.37	17-18
02-0009 60 Joslyn Pl	1965135103	5/4/2018	6/6/2018	629	\$28.81	\$61.40	\$3.81	\$94.02	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	6/5/2017	7/5/2017	42,160	\$1,691.44	\$1,313.05	\$13.62	\$3,018.11	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	7/5/2017	8/3/2017	35,200	\$1,760.94	\$1,254.06	\$13.54	\$3,028.54	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	8/3/2017	9/5/2017	40,000	\$1,428.93	\$1,333.81	\$14.34	\$2,777.08	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	9/5/2017	10/3/2017	35,280	\$1,345.63	\$1,295.20	\$9.23	\$2,650.06	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	10/3/2017	11/2/2017	34,720	\$1,152.04	\$1,303.05	\$17.27	\$2,472.36	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	11/2/2017	12/5/2017	42,960	\$1,496.45	\$1,343.14	\$11.57	\$2,851.16	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	12/5/2017	1/4/2018	34,080	\$1,993.77	\$1,400.33	\$9.18	\$3,403.28	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	1/4/2018	2/2/2018	42,240	\$2,765.78	\$1,330.48	\$9.83	\$4,106.09	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	2/2/2018	3/5/2018	48,000	\$1,535.05	\$1,449.37	\$13.37	\$2,997.79	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	3/5/2018	4/4/2018	45,840	\$1,496.05	\$1,526.61	\$14.07	\$3,036.73	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	4/4/2018	5/3/2018	42,800	\$1,749.48	\$1,322.56	\$0.00	\$3,072.04	17-18
02-0010 Bailey Ave Winspear Ave	9025135101	5/3/2018	6/5/2018	43,520	\$1,939.27	\$1,296.11	\$19.28	\$3,254.66	17-18

## CY 8 - Natural Gas Usage

facility_building	account_number	start	end	usage	commodity	utility	fee	total	type	Fiscal Yr
02-0001 Jersey St	366918404	6/30/2017	7/31/2017	131.3	\$378.86	\$540.01	\$71.29	\$990.16	cme	17-18
02-0001 Jersey St	366918404	7/31/2017	8/31/2017	169.5	\$416.14	\$500.49	\$70.28	\$986.91	cme	17-18
02-0001 Jersey St	366918404	8/31/2017	9/30/2017	360.6	\$979.14	\$712.68	\$65.49	\$1,757.31	cme	17-18
02-0001 Jersey St	366918404	9/30/2017	10/31/2017	749.5	\$2,927.15	\$878.27	\$64.37	\$3,869.79	cme	17-18
02-0001 Jersey St	366918404	10/31/2017	11/30/2017	1,987.9	\$5,453.83	\$1,650.08	\$64.14	\$7,168.05	cme	17-18
02-0001 Jersey St	366918404	11/30/2017	12/31/2017	3,121.7	\$10,243.44	\$3,812.90	\$64.04	\$14,120.38	cme	17-18
02-0001 Jersey St	366918404	12/31/2017	1/31/2018	1,144.3	\$3,375.60	\$2,131.59	\$22.68	\$5,529.87	cme	17-18
02-0001 Jersey St	366918404	1/31/2018	2/28/2018	872.7	\$3,455.17	\$1,880.32	\$22.73	\$5,358.22	cme	17-18
02-0001 Jersey St	366918404	2/28/2018	3/31/2018	960.4	\$2,629.45	\$1,604.39	\$22.78	\$4,256.62	cme	17-18
02-0001 Jersey St	366918404	4/2/2018	4/30/2018	428	\$443.70	\$1,005.06	\$18.84	\$1,467.60	cycle	17-18
02-0001 Jersey St	366918404	4/30/2018	5/29/2018	30	\$50.32	\$378.60	\$10.43	\$439.35	cycle	17-18
02-0001 Jersey St	366918404	5/29/2018	6/27/2018	9	\$28.85	\$345.55	\$8.66	\$383.06	cycle	17-18
02-0005 Manhattan Ave	671457001	6/30/2017	7/31/2017	1.3	\$3.99	\$5.14	\$0.37	\$9.50	cme	17-18
02-0005 Manhattan Ave	671457001	7/31/2017	8/31/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0005 Manhattan Ave	671457001	8/31/2017	9/30/2017	0.8	\$2.53	\$1.63	\$0.18	\$4.34	cme	17-18
02-0005 Manhattan Ave	671457001	9/30/2017	10/31/2017	0.6	\$2.56	\$0.68	\$0.08	\$3.32	cme	17-18
02-0005 Manhattan Ave	671457001	10/31/2017	11/30/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0005 Manhattan Ave	671457001	11/30/2017	12/31/2017	1.0	\$3.64	\$1.23	\$0.04	\$4.91	cme	17-18
02-0005 Manhattan Ave	671457001	12/31/2017	1/31/2018	0.9	\$2.99	\$1.70	\$0.03	\$4.72	cme	17-18
02-0005 Manhattan Ave	671457001	1/31/2018	2/28/2018	0.8	\$3.41	\$1.71	\$0.04	\$5.16	cme	17-18
02-0005 Manhattan Ave	671457001	2/28/2018	3/31/2018	1.0	\$3.01	\$1.64	\$0.04	\$4.69	cme	17-18
02-0005 Manhattan Ave	671457001	4/12/2018	5/14/2018	8	\$13.65	\$36.00	\$7.63	\$57.28	cycle	17-18
02-0005 Manhattan Ave	671457001	5/14/2018	6/13/2018	1	\$1.80	\$18.47	\$7.27	\$27.54	cycle	17-18
02-0006 Porter Ave	373931101	6/30/2017	7/31/2017	22.8	\$65.76	\$93.73	\$12.38	\$171.87	cme	17-18
02-0006 Porter Ave	373931101	7/31/2017	8/31/2017	44.8	\$109.99	\$132.29	\$18.58	\$260.86	cme	17-18
02-0006 Porter Ave	373931101	8/31/2017	9/30/2017	199.7	\$542.26	\$394.69	\$36.28	\$973.23	cme	17-18
02-0006 Porter Ave	373931101	9/30/2017	10/31/2017	473.3	\$1,848.37	\$394.00	\$40.65	\$2,283.02	cme	17-18
02-0006 Porter Ave	373931101	10/31/2017	11/30/2017	1,288.3	\$3,534.57	\$1,069.40	\$41.58	\$4,645.55	cme	17-18
02-0006 Porter Ave	373931101	11/30/2017	12/31/2017	2,048.2	\$6,721.01	\$2,501.75	\$42.03	\$9,264.79	cme	17-18
02-0006 Porter Ave	373931101	12/31/2017	1/31/2018	2,836.7	\$8,368.04	\$5,284.16	\$56.23	\$13,708.43	cme	17-18
02-0006 Porter Ave	373931101	1/31/2018	2/28/2018	2,152.1	\$8,520.45	\$4,636.87	\$56.05	\$13,213.37	cme	17-18
02-0006 Porter Ave	373931101	2/28/2018	3/31/2018	2,355.9	\$6,450.21	\$3,935.68	\$55.88	\$10,441.77	cme	17-18
02-0006 Porter Ave	373931101	4/2/2018	4/30/2018	1,822	\$1,888.84	\$3,199.24	\$56.05	\$5,144.13	cycle	17-18
02-0006 Porter Ave	373931101	4/30/2018	5/29/2018	137	\$229.77	\$547.02	\$22.09	\$798.88	cycle	17-18
02-0006 Porter Ave	373931101	5/29/2018	6/27/2018	6	\$19.23	\$340.83	\$8.09	\$368.15	cycle	17-18
02-0007 Massachusetts Ave	300272608	6/30/2017	7/31/2017	3.8	\$11.98	(\$178.95)	\$1.10	(\$165.87)	cme	17-18
02-0007 Massachusetts Ave	300272608	7/31/2017	8/31/2017	6.6	\$18.08	\$19.46	\$1.71	\$39.25	cme	17-18
02-0007 Massachusetts Ave	300272608	8/31/2017	9/30/2017	31.3	\$95.98	\$61.84	\$6.77	\$164.59	cme	17-18
02-0007 Massachusetts Ave	300272608	9/30/2017	10/31/2017	72.4	\$317.01	\$84.78	\$9.85	\$411.64	cme	17-18
02-0007 Massachusetts Ave	300272608	10/31/2017	11/30/2017	194.6	\$594.90	\$89.00	\$10.62	\$694.52	cme	17-18
02-0007 Massachusetts Ave	300272608	11/30/2017	12/31/2017	305.4	\$1,100.14	(\$31.79)	\$11.04	\$1,079.39	cme	17-18
02-0007 Massachusetts Ave	300272608	12/31/2017	1/31/2018	78.5	\$257.06	\$146.14	\$2.77	\$405.97	cme	17-18
02-0007 Massachusetts Ave	300272608	1/31/2018	2/28/2018	59.5	\$255.91	\$128.26	\$2.73	\$386.90	cme	17-18
02-0007 Massachusetts Ave	300272608	2/28/2018	3/31/2018	64.7	\$198.37	\$108.14	\$2.68	\$309.19	cme	17-18
02-0007 Massachusetts Ave	300272608	4/2/2018	5/2/2018	0	\$0.00	\$18.41	\$7.42	\$25.83	cycle	17-18
02-0007 Massachusetts Ave	300272608	5/2/2018	5/31/2018	0	\$0.00	\$18.41	\$7.16	\$25.57	cycle	17-18
02-0007 Massachusetts Ave	300272608	5/31/2018	7/2/2018	0	\$0.00	\$18.41	\$6.96	\$25.37	cycle	17-18
02-0008 29 Bailey Ave	341253808	6/30/2017	7/31/2017	3.8	\$11.98	\$15.43	\$1.10	\$28.51	cme	17-18
02-0008 29 Bailey Ave	341253808	7/31/2017	8/31/2017	5.3	\$14.46	\$15.57	\$1.37	\$31.40	cme	17-18
02-0008 29 Bailey Ave	341253808	8/31/2017	9/30/2017	9.1	\$27.79	\$17.90	\$1.96	\$47.65	cme	17-18
02-0008 29 Bailey Ave	341253808	9/30/2017	10/31/2017	17.5	\$76.69	\$20.51	\$2.38	\$99.58	cme	17-18
02-0008 29 Bailey Ave	341253808	10/31/2017	11/30/2017	45.8	\$139.98	\$38.00	\$2.50	\$180.48	cme	17-18
02-0008 29 Bailey Ave	341253808	11/30/2017	12/31/2017	70.5	\$254.15	\$86.16	\$2.55	\$342.86	cme	17-18
02-0008 29 Bailey Ave	341253808	12/31/2017	1/31/2018	72.1	\$236.14	\$134.25	\$2.54	\$372.93	cme	17-18
02-0008 29 Bailey Ave	341253808	1/31/2018	2/28/2018	54.8	\$235.44	\$117.99	\$2.51	\$355.94	cme	17-18
02-0008 29 Bailey Ave	341253808	2/28/2018	3/31/2018	59.8	\$183.34	\$99.94	\$2.48	\$285.76	cme	17-18
02-0008 29 Bailey Ave	341253808	4/23/2018	5/21/2018	13	\$24.47	\$53.67	\$7.76	\$85.90	cycle	17-18
02-0008 29 Bailey Ave	341253808	5/21/2018	6/20/2018	2	\$3.70	\$21.51	\$7.40	\$32.61	cycle	17-18
02-0009 60 Joslyn Pl	319503710	6/30/2017	7/31/2017	5.0	\$15.98	\$20.58	\$1.47	\$38.03	cme	17-18
02-0009 60 Joslyn Pl	319503710	7/31/2017	8/31/2017	5.3	\$14.46	\$15.57	\$1.37	\$31.40	cme	17-18
02-0009 60 Joslyn Pl	319503710	8/31/2017	9/30/2017	6.6	\$20.21	\$13.02	\$1.43	\$34.66	cme	17-18
02-0009 60 Joslyn Pl	319503710	9/30/2017	10/31/2017	9.9	\$43.46	\$11.62	\$1.35	\$56.43	cme	17-18
02-0009 60 Joslyn Pl	319503710	10/31/2017	11/30/2017	24.8	\$75.82	\$20.58	\$1.35	\$97.75	cme	17-18
02-0009 60 Joslyn Pl	319503710	11/30/2017	12/31/2017	37.3	\$134.34	\$45.54	\$1.35	\$181.23	cme	17-18
02-0009 60 Joslyn Pl	319503710	12/31/2017	1/31/2018	36.5	\$119.56	\$67.97	\$1.29	\$188.82	cme	17-18
02-0009 60 Joslyn Pl	319503710	1/31/2018	2/28/2018	27.8	\$119.43	\$59.85	\$1.27	\$180.55	cme	17-18
02-0009 60 Joslyn Pl	319503710	2/28/2018	3/31/2018	31.4	\$96.18	\$52.43	\$1.30	\$149.91	cme	17-18
02-0009 60 Joslyn Pl	319503710	4/3/2018	5/1/2018	24	\$33.19	\$69.88	\$8.05	\$111.12	cycle	17-18
02-0009 60 Joslyn Pl	319503710	5/1/2018	6/1/2018	7	\$13.18	\$32.64	\$7.88	\$53.70	cycle	17-18



02-0009 60 Joslyn Pl	319503710	6/1/2018	6/29/2018	4	\$15.08	\$26.81	\$7.77	\$49.66	cycle	17-18
02-0010 Bailey Ave Winspear Ave	311786903	6/30/2017	7/31/2017	0.0	\$0.00	(\$20.64)	\$0.00	(\$20.64)	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	7/31/2017	8/31/2017	1.3	\$3.62	\$3.89	\$0.34	\$7.85	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	8/31/2017	9/30/2017	5.8	\$17.68	\$11.27	\$1.25	\$30.20	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	9/30/2017	10/31/2017	13.4	\$58.80	\$15.73	\$1.83	\$76.36	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	10/31/2017	11/30/2017	36.2	\$110.82	\$30.08	\$1.98	\$142.88	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	11/30/2017	12/31/2017	57.4	\$206.95	\$70.16	\$2.08	\$279.19	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	12/31/2017	1/31/2018	50.2	\$164.40	\$93.46	\$1.77	\$259.63	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	1/31/2018	2/28/2018	38.1	\$163.78	\$82.08	\$1.75	\$247.61	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	2/28/2018	3/31/2018	41.2	\$126.23	\$68.81	\$1.71	\$196.75	cme	17-18
02-0010 Bailey Ave Winspear Ave	311786903	4/6/2018	5/7/2018	48	\$74.29	\$128.84	\$8.70	\$211.83	cycle	17-18
02-0010 Bailey Ave Winspear Ave	311786903	5/7/2018	6/6/2018	0	\$0.76	\$18.44	\$7.04	\$26.24	cycle	17-18
02-0010 Bailey Ave Winspear Ave	311786903	6/6/2018	7/5/2018	0	\$1.39	\$18.44	\$7.04	\$26.87	cycle	17-18
02-0010 Bailey Ave Winspear Ave	671456908	6/30/2017	7/31/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	7/31/2017	8/31/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	8/31/2017	9/30/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	9/30/2017	10/31/2017	0.0	\$0.00	\$0.00	\$0.00	\$0.00	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	10/31/2017	11/30/2017	1.0	\$2.91	\$0.79	\$0.05	\$3.75	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	11/30/2017	12/31/2017	1.0	\$3.64	\$1.23	\$0.04	\$4.91	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	12/31/2017	1/31/2018	1	\$2.99	\$1.70	\$0.03	\$4.72	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	1/31/2018	2/28/2018	1	\$3.41	\$1.71	\$0.04	\$5.16	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	2/28/2018	3/31/2018	1	\$3.01	\$1.64	\$0.04	\$4.69	cme	17-18
02-0010 Bailey Ave Winspear Ave	671456908	4/5/2018	5/7/2018	38	\$58.50	\$105.14	\$8.43	\$172.07	cycle	17-18
02-0010 Bailey Ave Winspear Ave	671456908	5/7/2018	6/4/2018	0	\$0.78	\$18.44	\$7.20	\$26.42	cycle	17-18
02-0010 Bailey Ave Winspear Ave	671456908	6/4/2018	7/5/2018	0	\$0.70	\$18.43	\$7.00	\$26.13	cycle	17-18
02-1005 Jersey St	366918502	6/30/2017	7/31/2017	1	\$3.99	\$5.14	\$0.37	\$9.50	cme	17-18
02-1005 Jersey St	366918502	7/31/2017	8/31/2017	4	\$10.85	\$11.68	\$1.03	\$23.56	cme	17-18
02-1005 Jersey St	366918502	8/31/2017	9/30/2017	16	\$47.99	\$30.92	\$3.39	\$82.30	cme	17-18
02-1005 Jersey St	366918502	9/30/2017	10/31/2017	36	\$158.50	\$42.39	\$4.92	\$205.81	cme	17-18
02-1005 Jersey St	366918502	10/31/2017	11/30/2017	96	\$294.53	\$79.95	\$5.26	\$379.74	cme	17-18
02-1005 Jersey St	366918502	11/30/2017	12/31/2017	152	\$548.24	\$185.86	\$5.50	\$739.60	cme	17-18
02-1005 Jersey St	366918502	12/31/2017	1/31/2018	150	\$490.21	\$278.69	\$5.28	\$774.18	cme	17-18
02-1005 Jersey St	366918502	1/31/2018	2/28/2018	113	\$487.94	\$244.54	\$5.21	\$737.69	cme	17-18
02-1005 Jersey St	366918502	2/28/2018	3/31/2018	125	\$381.70	\$208.08	\$5.16	\$594.94	cme	17-18
02-1005 Jersey St	366918502	4/2/2018	5/1/2018	72	\$101.30	\$166.31	\$9.35	\$276.96	cycle	17-18
02-1005 Jersey St	366918502	5/1/2018	5/29/2018	26	\$51.55	\$80.63	\$9.95	\$142.13	cycle	17-18
02-1005 Jersey St	366918502	5/29/2018	6/27/2018	0	\$0.70	\$18.42	\$7.00	\$26.12	cycle	17-18

# Annual Safety Audit

	Employee Submitting Report	Pro-Active Safety Activity	Date Observed	Brief Description	Required Resolution, Corrective Action, or Necessary Follow Up	Date Resolved (if applicable)	Completed?
1	Doug Fultz	Unsafe condition	1/18/2018	Area out side of training room was wet and slippery due to snow	None- already completed	N/A	Yes
2	Doug Fultz	Job or Peer-to-Peer Observation	1/24/2018	Observed electrical contractors installing communicaion cable in the	None	N/A	Yes
3	David Hill	Job or Peer-to-Peer Observation	2/1/2018	Maintenance staff was moving cabinets from the lab to prepare for	None	N/A	Yes
4	David Hill	Stop work if unsafe act or condition	2/7/2018	Worked with Allied Environmental to secure the basement area of	Allied performed additional remediation of spill site that	2/19/2018	Yes
5	Damond Rand	Job or Peer-to-Peer Observation	2/12/2018	Ensured meter readers have appropriate PPE equipment in	None	N/A	Yes
6	Damon Sykes	Near-Miss w/ corrective action	2/14/2018	Fire extinguisher in the training room was blocked by a table when	I moved table immediately so that the extinguisher was not	02/15/2018	Yes
7	Doug Fultz	Job or Peer-to-Peer Observation	2/15/2018	Observed contractor provide clean-up services for a mercury spill.	None	2/23/2018	Yes
8	David Hill	Safety briefing or training	3/1/2018	Safety Comittee meeting with Veolia staff and Buffalo Water	None	N/A	Yes
9	Damond Rand	Unsafe condition	3/1/2018	I observed several power cords in the walk-way of our conference	Removed power-cords to another plug within the area which		
10	David Hill	Unsafe condition	3/8/2018	FLoor grating is broken at the bottom of the steps in basement pipe	Placed cone over broken grate. Will have maintenance fix		
11	Damon Sykes	Job or Peer-to-Peer Observation	3/15/2018	Observed contractors performing roof repairs at Colonel Ward	None	N/A	N/A
12	Elina Flores	Safety briefing or training	3/18/2018	Fall protection equipment inspection is scheduled to be completed			
13	Colleen Makar	Safety briefing or training	3/21/2018	Veolia Team Safety Meeting - Specialized Group Training	None	N/A	N/A
14	Elina Flores	Near-Miss w/ corrective action	3/26/2018	Restrooms at exchange need a more in depth clean on corners	I have contacted Coverall and requested to clean the corners	N/A	N/A
15	Elina Flores	Potential Property damage w/	4/6/2018	Some parking lines at Exchange St. are disappearing. This could	I have contacted the landlord and requested an update on	N/A	N/A
16	David Hill	Safety briefing or training	4/12/2018	Safety Comittee meeting with Veolia staff and Buffalo Water	None	NA	Yes
17	David Hill	Unsafe condition	4/17/2018	Roof over stone pit pulling away	Block off area with signage and cones.	6/26/2018	Yes
18	David Hill	Process improvements or upgrades	4/18/2018	Discussed Fall Protection PPE needs and storage location		NA	Yes
19	David Hill	Process improvements or upgrades	4/18/2018	Site safety walkthrough - Old Boiler Plant		NA	Yes
20	Damond Rand	Unsafe condition	4/20/2018	Emergency light fixture near training room was hanging from ceiling.	Yes - emergency light was repaired	N/A	Yes
21	Damon Sykes	Unsafe condition	5/1/2018	A hose was laying the middle of the floor in an office that people	Prior to the contractor showing up, a CoB worker idefntified the	05/01/18	Yes
22	Doug Fultz	Unsafe condition	5/3/2018	The eve of the boiler plant roof pulled away and was unstable.	EMergency repairs. Eve was taken down. Repairs will be made and the eve reinstalled.	6/26/2018	Yes
23	Mike Carson	Unsafe condition	5/3/2018	Safety Recall - Square D disconnects -	Performed audit to make certain that plant did no t have any of these devices.	05/20/2018	Yes
24	David Hill	Safety briefing or training	5/10/2018	Buffalo Water Safety Meeting		NA	Yes
25	Doug Fultz	Stop work if unsafe act or condition is observed	6/19/2018	Contractor (painter) positioned a ladder to paint the ceiling and walls over a stairwell in an unsafe position.	Project inspector was notified and stopped work immediately and instructed contractor to install scaffolding or other safe provisions to facilitate painting of area.	6/19/2018	Yes
26	Colleen Makar	Near-Miss w/ corrective action	6/19/2018	Contractors performing work near garage door properly blocked area off with safety cones, directing individuals to walk around the work zone.	None	N/A	Yes

# Annual Leak Detection Report

## ANNUAL LEAK DETECTION REPORT

Veolia previously developed a comprehensive leak detection program tied to the unidirectional flushing and valve maintenance program. This was developed using the InfoNet™ geodatabase and identifies specific sequences to exercise valves and flush hydrants. In this program, valves are located and exercised, hydrants are flushed, and when this phase is completed, City personnel will subsequently utilize a Metrotech™ HL-90 Leak Detector to “listen” on the valves. This device amplifies the sound that a leak produces and when noise is apparent, and the potential leak location is recorded. City personnel will then position ZCorr™ data loggers on the valve and on adjacent valves to better refine the location of the leak.

With the data obtained from this program, the severity of the leak can be estimated as well as an approximate location. Work crews would be subsequently dispatched to the location(s) identified to address the leak(s). Once this initiative is fully adapted by the Buffalo Water Distribution Department the program can be further enhanced through the acquisition of correlation equipment, which will be utilized to locate leaks within a reasonable distance from valve locations. Typically, microphones or acoustic sound sensors are placed in contact with the pipe between two valves to record the sound emitted by a leak somewhere between the valves. The sound is processed through a mathematical algorithm which compares or correlates the two recordings to determine the difference in the times it takes noise to travel from the site of the leak to each of the sensors.

During the past year, the daily work schedules were full, consisting of main repairs, hydrant maintenance, hydrant replacement, and valve exercise, repair and replacement. A large-scale leak detection program has been placed on hold until such time that City personnel can be augmented to include additional supervision and field crews that will be dedicated specifically to this program.

Currently, we continue to utilize the data logging technology to locate suspected leaks. In several strategic areas of the City, leak detection was performed on a smaller scale. A leak detection work order was developed in InfoNet to assist with the planning and scheduling of leak detection. Results would indicate whether or not additional investigation was required.

In an effort to augment the City personnel performing leak detection, New York Leak Detection (NYLD) was solicited to provide a proposal to perform a system-wide leak detection evaluation. In order to perform a leak detection evaluation on the entire service territory, NYLD personnel required the full time assistance of City personnel to accompany the leak detection team. This was due to the need for City personnel to facilitate access to valve operating stems, valves located within vaults and GIS mapping assistance to locate buried system valves.

Based on the overall scope of work associated with a system-wide leak detection survey, as well as the required level of assistance from City personnel, it was determined that a system-wide leak detection survey will be conducted when staffing levels permit this work without sacrificing current operational requirements. Veolia strongly recommends that this work occur as soon as possible, as the data obtained from a leak detection survey will also assist with calibration of the distribution system hydraulic model.

# Annual Inventory Report



## ANNUAL INVENTORY REPORT

A well-stocked inventory is critical to a water system. Inventory has been maintained to sufficient operating levels during CY8. The hydrant inventory count has continued to be a very valuable tool throughout the year. Currently, the Stock Clerk maintains all inventories through spreadsheets.

In the Filter Plant, operators continue to track chemical inventory through electronic logs. This allows the Water Treatment Supervisor, as well as Veolia Managers, to maintain adequate chemical levels and plan for reorder. The chemical inventory at the end of CY8 is below.

<b>CHEMICAL INVENTORY (as of June 2018)</b>	
Chemical	Pounds
Chlorine	14,175
Fluoride	0
Orthophosphate	26,693
Polyaluminum Chloride	18,961
Polymer (Clarifloc N-6310)	500
Polymer (Clarifloc C-6210)	3,772

Meter inventory and operating supplies managed through the Stock Room are presented on the following pages.

# Buffalo Water operated by Veolia Water

## Store Meter Listing

Date : 10/29/2017 3:46:39 PM

User Name :DamonS

Store Code : 200 Description WAREHOUSE 2

Meter Model	Meter Model Totals
	Totals
T-10 3/4"	38
T-10 5/8" X 3/4"	106
T-10 1"	174
T-10 1-1/2"	106
T-10 2"	62
HP TURBINE 8" RR	7
TR/FLO CMPD 3" LO RR	3
TR/FLO CMPD 3" HI RR	8
TR/FLO CMPD 4" LO RR	2
TR/FLO CMPD 4" HI RR	6
TR/FLO CMPD 6" LO RR	2
TR/FLO CMPD 6" HI RR	1
HP TURBINE 6" RR	9
HP TURBINE 10" RR	2
HP PRTCTUS 8" HI RR	2
T-10 2" RR	1
T-10 5/8" X 3/4" RR	3
T-10 5/8"	100
HP TURBINE 2" RR	5
HP PRTCTUS 6" HI RR	2
HP PRTCTUS 10" HI RR	3
HP TURBINE 4"	17
HP TURBINE 3"	15
T-10 5/8 X 3/4" R900	779
T-10 3/4" R900i	66
T-10 1" R900i	98
T-10 1-1/2" R900i	85
T-10 5/8" R900i	7
T-10 2" R900i	16
Totals	1,725

## HYDRANT INVENTORY COUNT - AMOUNTS INCLUDE ALL MUELLER HYDRANTS AND WHAT IS ON THE TRUCKS

COLOR	SIZE	1/25/18	2/27/18	3/26/18	4/24/18	5/24/18	6/25/18						
NO COLOR	4'	7	6	9	9	9	8						
RED	4.5'	11	10	9	9	6	7						
BLUE	5'	21	17	25	22	21	19						
WHITE	5.5'	16	26	20	19	12	3						
YELLOW	6'	26	25	21	18	14	24						
ORANGE	6.5'	14	12	8	6	5	5						
NO COLOR	7'	8	6	5	3	9	9						
TOTAL:		103	102	97	86	76	75						

ITEM	LOCATION	INVENTORY QTY.
utility knife	A-000	1
utility knife blade refills	A-000	82
disposable cold compress 4x5	A-000	8
welding googles lift front	A-000	5
deluxe earmuffs	A-000	6
earmuffs to helmet	A-000	10
eyewash 1 oz squeeze bottle 12 pk	A-000	5
bee sting wipes 10 pk	A-000	2
clear safety glasses (overstock over a-100)	A-000	134
dark safety glasses (overstock over a-100)	A-000	59
dark safety glasses (overstock over a-100)	A-000	72
over the glasses safety glasses	A-000	2
rubber hand grips for jack hammers (Hertz)	A-000	10
ant traps	K-021	8
bungee cord black rubber	A-000	0
24 INCH BUNGEE CORDS	A-000	2
carabiners	A-000	10
bungee cord - assorted 10 pack	A-000	3
drum plugs 2 inch (McManus)	A-000	5
bungee cord 15 in (Martin)	A-000	6
Plug in chargers for spotlights	A-000	2
batteries C size 6 pk overstock K-021	A-000	497
batteries D size 6 pk	A-000	26
batteries AA size	A-000	426
batteries AAA size	A-000	98
battery lantern 6 volt	A-000	5
battery 9 volt	A-000	321
caution tape	A-000	13
duct tape	A-000	7
electrical tape (10/pk)	A-000	12
teflon tape	A-000	51
pillows for freeze kits	A-000	4
OD tapes from USA Bluebook	A-000	
OD tapes	A-000	8
water dye	A-000	7
drill bits 7/32	A-001	8
dril bits 1/16	A-001	10
drill bits 19/64	A-001	2
hacksaw blades 12 in	A-002	2
hacksaw blades 10 in (IN PACKS OF 10)	A-002	22
hacksaw blades 12 in PACKS OF 10	A-002	22
reciprocating blades - metal	A-002	5
reciprocating blades - wood	A-002	20
reciprocating blades 9 INCH (McCabe)	A-002	10
reciprocating blades 1 INCH (McCabe)	A-002	18
keepers	A-003	34
ring pin dent 3/8 x 2 in	A-003	18
ring pin dent 3/8 x 4 in	A-003	13
pins for Wach machine	A-003	1
thin cotter pins 2 3/4	A-003	0
thin cotter pins 1 1/4	A-003	0

ITEM	LOCATION	INVENTORY QTY.
cotter pins 3/16 x 1	A-003	38
cotter pins 3/16 x 1 1/2	A-003	31
cotter pins 3/16 x 1 1/4	A-003	9
cotter pins 3/16 x 2	A-003	8
cotter pins 1/16 x 1	A-003	50
cotter pins 1/16 x 1 1/2	A-003	38
cotter pins 1/16 x 2	A-003	50
cotter pins 5/16 x 2 1/2	A-003	30
cotter pins 5/16 x 3 1/2	A-003	14
cotter pins 1/4 x 1	A-003	38
cotter pins 1/4 x 1 1/4	A-003	103
cotter pins 1/4 x 1 1/2	A-003	20
cotter pins 1/4 x 2	A-003	15
cotter pins 1/4 x 2 1/2	A-003	19
cotter pins 1/4 x 3	A-003	55
cotter pins 1/4 x 3 1/2	A-003	47
cotter pins 1/2 x 2 1/2	A-003	14
cotter pins 3/8 x 1 1/4	A-003	14
cotter pins 3/8 x 2	A-003	28
cotter pins 3/8 x 3	A-003	7
<b>Miller push pins with key ring for tripod winch-from Dival</b>	A-003	
bull nose vandal proof set screws/plug	A-004	13
vandal proof plug wrench/Allen key replacement for socket	A-004	30
bolts for vandal proofs	A-004	43
pipe hangers	A-004	11
<b>McManus safety pin wire snap</b>	A-004	5
4 1/2 IN DEPRESSED CUT OFF WHEEL 60 GRIT <b>DEWALT</b>	A-005	19
4 1/2 in cutting wheel T27 (2KNC8)	A-005	1
drill bits 13/32	A-005	1
drill bits 15/32	A-005	0
drill bits 17/32	A-005	3
drill bits 37/64	A-005	1
drill bits 35/64	A-005	4
drill bits 29/64	A-005	3
jobber drill brite 21/64	A-005	0
drill bits 1/8	A-005	4
drill bits 1/4	A-005	21
twist drill 1/4	A-005	3
drill bits 3/16	A-005	44
drill bits 1/16	A-005	48
sheer pins for snowblowers - <b>Tom Cavanagh</b>	A-006	14
drill bit 1" 1/2 shank masonry percussion	A-007	8
drill bit 5/8 x 6 1/2 shank masonry percussion	A-007	5
drill bit 1/2 1/4 shank masonry percussion	A-007	2
drill bit 7/8 1/2 shank masonry percussion	A-007	8
drill bit 5/16 1/4 shank masonry percussion	A-007	0
drill bit 11/16 1/2 shank masonry percussion	A-007	8
drill bit 5/32 1/8 shank masonry percussion	A-007	4
drill bit 9/16 1/2 shank masonry percussion	A-007	8
drill bit 3mm x 1/8 masonry drill	A-007	1
drill bit 3/4 1/2 shank masonry percussion	A-007	4
drill bit 11/64 5/32 shank masonry percussion	A-007	4

ITEM	LOCATION	INVENTORY QTY.
drill bit 1/8 7/64 shank masonry percussion	A-007	2
drill bit 7/16 1/4 shank masonry percussion	A-007	7
masonry percussion bit 3/16 with 11/64 shank	A-007	1
drill bitt 1/2 shank 6" size 37/64	A-008	1
drill bitt 1/2 shank 6" size 27/32	A-008	0
drill 3/4" taper shank #510 - 2TS	A-008	1
drill 3/4" 4/-10130 510	A-008	1
3/4 H.S. drill taper shank	A-008	1
drill bit 7/8 #3 taper shank	A-008	2
drill bit 13/16 #3 taper shank	A-008	1
drill bit 11/16	A-008	0
drill bit 5/8	A-008	3
1/2 in shank drill bit 25/32	A-008	1
1/2 in shank drill bit 9/16	A-008	6
1/2 in shank drill bit 23/32	A-008	1
drill bit 9/16	A-008	26
drill bit 27/64	A-008	12
drill bit 1/2 general purpose NO 150	A-008	14
drill bit 19/32 1-150 EDP 44038	A-008	0
drill bit 17/32 1-150 EDP 44034	A-008	1
assorted thin bolts with nuts and washers	A-008	15
screw extractor #192 NO 12 ezy-out use 1 15/16 drill (304159)	A-009	1
9/16 - 18 thread tap	A-009	4
screw extractor NO 9	A-009	12
screw extractor NO 8	A-009	1
screw extractor NO 192 NO 11	A-009	1
screw extractor lot NO 192 size 10	A-009	1
drum de-header	A-010	1
National O-Ring gauge	A-010	1
New Halogen lamp T3 , 5000W	A-010	3
halogen lamp tungston 130V 250W 78MM R7S 3 1/8" long	A-010	16
Luma Pro light bulb replacements (4 in a box)	A-010	16
Philips halogen light bulb dbl ended 120V 250W	A-010	6
rivets aluminum buttonhead 1/8" diameter grip range up to 1/8" (box)	A-010	1
rivets aluminum buttonhead 1/8" diameter grip range 1/4" to 3/8"(box)	A-010	1
500 watt halogen bulbs for work lites	A-010	5
blue <b>LOCKER</b> T-bolt with nut 3/4 in x 3 1/2 in (overstock office floor)	A-011	217
blue <b>LOCKER</b> T-bolt with nut 3/4 in x 4 in (overstock office floor)	A-011	230
blue <b>LOCKER</b> T-bolt with nut 3/4 in x 4 1/2 in (overstock office floor)	A-011	49
<b>washers for freeze kits - Praxair</b>	A-012	20
<b>Mueller nozzle locks</b>	A-012	31
cutting wheels for Ridgid tubing cutter #33105	A-012	23
cutting wheels for Ridgid tubing cutter #33165	A-012	26
cutting wheels for Ridgid tubing cutter #33190	A-012	6
cutting wheels for Ridgid tubing cutter #33185	A-012	9
nozzles for Chapin sprayer used in bleach spraying	A-012	10
RIDGID PINS WITH CLIP	A-012	10
cutting wheels for Wheeler Rex 4 wheel pipe cutter	A-012	13
hose clamp dia. 1 1/2" to 2 in (overstock A-022)	A-013	37
hose clamp 2 to 3 inch (overstock A-022)	A-013	40
hose clamp 3 to 4 inch (overstock A-022)	A-013	57
hose clamp dia. 1" to 2 inch (overstock A-022)	A-013	40



ITEM	LOCATION	INVENTORY QTY.
hose/worm clamps dia. 2 1/16 to 3 in	A-013	4
hose clamp 1/2" to 1 1/16" (OS in A-021)	A-013	56
worm gear clamp stainless steel 9/16 - 1 1/16 14 - 27 mm	A-013	0
<b>Peerless</b> worm clamps 2 to 3 in <b>OS IN a-022</b>	A-013	35
3/4 m hose x 3/4 m hole barb	A-015	48
3/4 m hose barb x 3/4 m hose barb	A-015	57
3/4 m hose barb x 3/4 MIP	A-015	12
3/4 m hose barb x 3/4 F hose thread	A-015	11
3/4 brass m x 3/4 brass m coupling	A-015	22
plastic 5/8 coupling	A-015	10
1 inch brass female with swivel nut short shank	A-015	18
packing puller	A-015	3
cork screw replacements for packing puller	A-015	9
3/4 m hose barb x 5/8 F hose thread	A-015	29
5/8 brass m x 5/8 brass m coupling	A-015	7
1/2 brass m barb x 1/2 brass m barb coupling	A-015	0
brass 3/4" female garden hose x 3/4 MIP thread	A-016	76
brass hose fittings water 3/4" NH (f) x NPT (f)	A-016	47
brass 3/4" garden hose x 3/4" MIP adapter	A-016	48
3/4 in swivel female hose connection	A-016	20
3/4 in swivel female hose connection (Grainger in overstock)	A-016	20
brass hose fittings water 3/4" female hose swivel x 3/4" female hose swivel (hose to hose) 132682	A-016	47
3/4 IN hose repair kit male/female	A-016	13
ball end hex key (allen) set	A-016	1
washers red	A-016	47
wrench Allen 3/16"	A-016	36
wrench Allen 1/4"	A-016	71
wrench Allen 3/8"	A-016	9
5/16 Allen wrench	A-016	13
coupler plug brass 1/4 MNPT	A-016	12
quick coupler 1/4 FNPT brass	A-016	12
valve box cleaner <b>blade</b> repair kit (OS in A-066)	A-017	20
valve box cleaner spoons with links and rivets repair kit	A-017	13
<b>mud</b> "cup type" kit for valve box cleaners (OS in A-066)	A-017	20
FasPin with ball rivet for valve box cleaners	A-017	16
Air King safety clips Dixon AC-1	A-017	64
Air King lanyards	A-017	150
rivets for valve box cleaner blades	A-017	105
Air King washers	A-017	88
1/2 hose barb x 1/4 N.P.T. air hose fitting	A-017	18
1/2 hose barb x 3/8 N.P.T. air hose fitting	A-017	25
1/2 hose barb x 1/2 N.P.T. air hose fitting	A-017	3
brass fittings for Pollard cherry picker	A-017	10
O-ring Matthews pressure seal	A-018	36
O-ring Matthews pressure seal	A-018	71
O-ring Kennedy	A-018	58
O-ring 6" valve gland	A-018	60
Homelite gas saw part - outer washer	A-019	4
Homelite gas saw part - shield	A-019	3
Homelite gas saw part - shield inne	A-019	1
Homelite gas saw part - handle gasket	A-019	3
Homelite gas saw part - bushing	A-019	8

ITEM	LOCATION	INVENTORY QTY.
Homelite gas saw part - rewind spring	A-019	1
Homelite gas saw part - manifold in	A-019	1
Homelite gas saw part - grip spring	A-019	5
Homelite gas saw part - pulley & rope cup	A-019	1
Homelite gas saw part - nut cover mtg	A-019	6
Homelite gas saw part - repair kit	A-019	3
Homelite gas saw part - washers	A-019	20
Homelite gas saw part - screws	A-019	5
Homelite gas saw part - washer	A-019	5
Homelite gas saw part - bushing	A-019	3
Homelite gas saw part - rewind spring	A-019	1
Homelite gas saw part - bolt blade	A-019	2
Homelite gas saw part - spacer	A-019	2
Homelite gas saw part - screws	A-019	6
Homelite gas saw part - screws	A-019	6
spark plug connector	A-019	2
spark plug Autolite	A-019	2
spark plug Honda NGK BPR6ES	A-019	2
Honda parts	A-019	2
Honda part - gasket	A-019	2
H-Bar top bracket	A-019	2
strainer Homelite	A-019	6
shaft seal Wayne	A-020	3
Brady foot valve strainer ( <b>Blue strainers</b> )	A-020	23
4 pc brush kit Wayne	A-020	1
volute gasket for PC4	A-020	5
rope segments	A-020	11
B holder Gorman-Rupp	A-020	3
brush kits	A-020	6
repair kit	A-020	2
blue plastic hose fitting	A-020	6
impeller kit for PPS-12	A-020	21
bolts 7" x 1/2" stainless steel - thread only 2" 5/8	A-021	110
bolts 8" x 1/2" stainless steel - thread only 2" 5/8	A-021	94
clamp worm Breeze 9" diameter	A-021	3
clamp worm Tyler 6" diameter	A-021	1
Honda adapter	A-022	30
Reed 2 inch re-rounding tool for copper	A-022	1
hose clamp 2 to 5 in	A-022	23
clamp worm hose Ideal size 72 5 (10/bx)	A-022	0
Peerless clamp 1 13/16 - 2 3/4	A-022	4
worm gear hose clamps 2 1/16" to 3"	A-022	0
Teel Marine utility pump manual and parts	A-022	8
adapter Honda 1" NPT x 3/4"	A-022	4
hammer style flaring tool Ridgid 2"	A-022	9
hammer style flaring tool Ridgid 1 1/2"	A-022	4
hammer style flaring tool Ridgid 1 1/4"	A-022	9
hammer style flaring tool Ridgid 1"	A-022	12
hammer style flaring tool Ridgid 3/4"	A-022	4
washer 3/8 IN (100 PK.)	A-023	
washer 5/8 in (65 bx)	A-023	4
washer flat 1/4 (100 per box)	A-023	100

ITEM	LOCATION	INVENTORY QTY.
washer flat 5/16 (50 per box)	A-023	50
washer fender 5/16 (100 per pak)	A-023	100
washer 3/4 in (45 bx) <b>OS in M-108</b>	A-023	37
flat washer 1/4 in	A-023	50
split washer 1/4 in	A-023	96
nut 1/4 in	A-023	96
zinc cap screw 1/4" x 1 1/2 in	A-024	97
zinc cap screw 1/4" x 1 1/4 in	A-024	44
zinc cap screw 1/4" x	A-024	100
zinc cap screw 1/4" x 2 in	A-024	100
1/4 in hex nuts zinc	A-024	200
1/4 in hex nuts zinc	A-024	40
zinc cap screw 5/16" x 1 1/2 in	A-025	92
zinc cap screw 5/16" x 1 3/4 in	A-025	90
zinc cap screw 5/16" x 2 in	A-025	100
zinc cap screw 5/16" x 2 1/2 in	A-025	
zinc cap screw 5/16" x 3 in	A-025	100
zinc cap screw 5/16" x 4 in	A-025	50
1/4 in zinc flat washer	A-025	76
zinc cap screw 5/16" x 5 in	A-025	50
zinc cap screw 5/16" x 1/2 in	A-025	98
5/16 in zinc nut	A-025	88
zinc cap screw 5/16" x 3/4 in	A-025	100
zinc cap screw 5/16" x 1 in	A-025	84
zinc cap screw 5/16" x 1 1/4 in	A-025	100
zinc cap screw 3/8" x 1 in	A-026	100
zinc cap screw 3/8" x 1 1/2 in	A-026	95
zinc cap screw 3/8" x 2 in	A-026	93
zinc cap screw 3/8" x 2 1/2 in	A-026	41
zinc cap screw 3/8" x 3 in	A-026	40
zinc cap screw 3/8" x 3 1/2 in	A-026	50
zinc cap screw 3/8" x 4 in	A-026	50
zinc cap screw 3/8" x 4 1/2 in	A-026	50
zinc cap screw 3/8" x 5 in	A-026	50
3/8 in zinc nut	A-026	87
zinc cap screw 7/16" x 1 1/2 in	A-027	50
7/16 in zinc nut	A-027	50
7/16 in flat zinc washer	A-027	151
5/8 washers	A-030	40
5/8 washers	A-030	50
washers 7/8" regular	A-032	5
washers 7/8" split	A-032	68
washers 3/4" lock	A-032	222
nuts hex zinc 7/8"	A-032	221
bolts 7/8" x 3 1/2"	A-032	95
bolts 7/8" x 4"	A-032	40
bolts 7/8" x 3"	A-032	49
flat washers 3/4	A-032	147
washer 7/8	A-032	57
bolts plain 3/4" x 4 1/4"	A-033	37
nuts 3/4"	A-033	282
chain hook washer	A-039	8

ITEM	LOCATION	INVENTORY QTY.
hook nuts, very large	A-039	4
chain hook bolt only	A-039	10
chain hook sub assembly with nut for round link chain	A-039	1
EZ screw plug open ended wrench	A-039	1
wrench for chain hook nut & tool releasing screw	A-039	1
chain hook for A-3 machine	A-039	2
PVC deep taps 5/8"	A-040	2
PVC deep taps 3/4"	A-040	0
special long 3/4" tap	A-040	3
3/4" tap used	A-040	9
1" used tap	A-040	3
new tap 5/8"	A-040	6
new tap 3/4"	A-040	0
new tap 1"	A-040	0
new tap 1 1/2"	A-040	-1
pilot bits for Smith Paten machine	A-040	0
boring bar drift pin	A-041	4
valve stem packing	A-041	9
handle screw knob	A-041	5
boring bar thrust collar (friction collar) 83847 for A-3 machine	A-041	1
friction collar for B-101 machine	A-041	
roll pin B-101 spare part	A-041	5
lock washer	A-041	8
boring bar packing	A-041	6
by-pass valve gasket	A-041	20
spring washer (boring bar o-ring)	A-041	6
o-ring (2-boring bar packing)	A-041	13
by-pass valve complete	A-041	0
chain yoke retaining screw/hex socket set screw	A-041	11
by-pass valve gasket	A-041	7
valve stem	A-041	4
valve stem retaining nut	A-041	13
lever handle	A-041	5
handle nut	A-041	3
valve body packing	A-041	5
valve gate (flapper)	A-041	3
valve gate arm	A-041	4
rubber gate washers(for gate/flapper)	A-041	5
valve washer & stem(for gate/flapper)	A-041	6
lock screw (gate)	A-041	8
lock nut (for gate/flapper)	A-041	5
oil hole plug	A-041	12
cap packing O-ring	A-041	7
bearing sleeve B-101 spare parts	A-041	7
bearing	A-041	14
knock out pin	A-041	5
tool retaining screw	A-041	5
chain 12 "	A-041	1
wiper ring	A-041	5
handle screw	A-041	2
boring bar wiper ring for A-3 drill/tap machine	A-041	6
by-pass valve screw	A-041	9

ITEM	LOCATION	INVENTORY QTY.
blow off valve	A-041	4
by-pass valve sub assembly B-101 spare parts	A-041	6
vac breaker	A-041	1
drills for B101 & A3 machines 3/4" short	A-042	9
drills for B101 & A3 machines 1" long	A-042	3
drills for B101 & A3 machines 1" short	A-042	3
drills for B101 & A3 machines 2"	A-042	8
pins for B101 tap drills	A-042	44
seat nut for by-pass	A-043	10
boring bar wiper ring	A-043	6
boring bar O-ring	A-043	7
feed sleeve O-ring	A-043	3
seat washer for B drill/tap machine	A-043	7
seat nut washer for valve stem	A-043	4
stem	A-043	8
screw for valve stem	A-043	7
stem packing nut	A-043	1
handle knob for B drill/tap machine	A-043	7
hand knob screw/machine screw	A-043	6
gate to arm screw	A-043	1
gate screw washer	A-043	0
seat washer screw	A-043	1
nut	A-043	1
valve stem	A-043	2
hand wheel nut	A-043	1
stem handle wheel	A-043	1
A-3 handle	A-043	4
gate arm	A-043	3
tool retaining screw for B drill/tap machine	A-043	9
stem packing washer	A-043	1
pins	A-043	7
body plate	A-043	4
gate	A-043	3
seat washer	A-043	8
gate washer	A-043	1
cap gasket	A-043	5
EZ release screw plug 1 1/4"	A-044	12
EZ release screw plug 1"	A-044	22
tamper resistant span wrench for ring retainer	A-044	5
EZ release screw plug 3/4"	A-044	12
handle extension sub A-3 machine ratchet handle	A-044	2
handle	A-045	3
counter	A-045	3
counter auto fee	A-045	1
pilot drill 11 1/2" - for 12 inch C-12 cutter	A-045	1
pilot drill 9 1/2" - for 10 inch C-12 cutter	A-045	1
pilot drill for 8 in cutter C-12 machine	A-045	
crank	A-045	2
EZ release screw plug 2" inserting tool	A-045	12
EZ release screw plug 1 1/2" inserting tool	A-045	11
<b>NEW</b> cominbined drill and tap 3/4 inch Mueller pilot cc thread ( <b>more in A-042</b> )	A-046	0
saddles 26-41	A-046	5

ITEM	LOCATION	INVENTORY QTY.
saddles 40 - 42 - 48 CI	A-046	4
saddles 36 CI	A-046	1
saddles 10" CI	A-046	6
saddles 11" - 14 1/2"	A-046	0
saddles 16 CI 16 - 19 3/8"	A-046	1
saddles 19 - 21 1/8	A-046	0
saddles 29 - 29 1/8	A-046	0
saddles 4 3/8 - 5	A-046	4
saddles 6 11/16 - 7 1/8	A-046	1
saddles 3 1/2 - 4	A-046	0
saddles 8" - 9 1/2	A-046	0
<b>replacement parts for re-circ valve</b>	A-047	
saddle gasket 4 1/2 " B 101 spare parts	A-047	7
saddle gasket 4 1/2 " B 101 spare parts	A-047	15
saddle gasket small A-3	A-047	7
saddle gasket large A-3	A-047	8
saddle 16 - 18 3/4	A-048	2
wrench for EZ release screw plug	A-048	2
body	A-048	1
saddle 11 7/8 - 13 1/2	A-048	1
bit combined drill & tap 36" - 48" long 1" CC thread CI pipe	A-048	2
bit combined drill & tap 36" - 48" long 2" CC thread CEM-RES	A-048	0
bit combined drill & tap 36" - 48" main 1 1/2" CEM-RES	A-048	1
bit combined drill & tap long 3/4" CC thread CI pipe	A-048	2
feed nut and yolk complete	A-048	1
large bicycle type chain	A-048	1
feed sleeve and cap	A-048	1
feed nut and yoke assembly	A-048	2
valve gate arm (also in A-041)	A-048	2
ratchet handle B-101 machine C size ratchet wheel square .822 handle sub assembly	A-048	2
3/4 inch combined drill/tap for B-101 machines <b>NEW</b>	A-048	0
cylinder for B-100 & B-101 machine <b>NEW</b>	A-048	2
retaining screws for air motor holder	A-048	14
coupling 1 1/2" copper flare X 1 1/2" FIP	A-049	5
coupling 1" copper flare x 3/4" MIP	A-049	15
coupling 1" flare copper by 1" FIP thread	A-049	17
coupling 1" flare copper by 1" MIP thread ( <b>OS in A-073</b> )	A-049	20
coupling 1" flare copper by 1 1/2 FIP thread	A-049	9
coupling 1 1/4" copper flare x 1 1/4" FIP	A-049	7
coupling 1" flare copper by 1 1/4 FIP thread	A-049	7
coupling 3/4" copper flare x 1" MIP	A-049	21
coupling 1" copper flare x 3/4" FIP	A-049	23
coupling 3/4 flare copper by 3/4 FIP thread	A-050	40
copper tub nut 1" FIP x 3/4" MIP	A-050	1
coupling 1 1/4" MIP x copper flare	A-050	4
coupling 3/4 flare copper by 3/4 MIP thread	A-050	12
coupling 3/4 flare copper by 3/4 MIP thread <b>NL (overstock )</b>	A-050	
coupling 3/4 flare copper by 1" FIP thread	A-050	42
flat head coupling 2" x 3/4" FIPFH X C	A-051	18
flat head coupling 2 1/2" FIPFH x 1" copper flare	A-051	4
flat head coupling 2" FIPFH x 1 1/4" copper flare	A-051	4



ITEM	LOCATION	INVENTORY QTY.
straight coupling female XS lead flange thread x copper flare nut 1 1/4 x 1 1/2 Mueller	A-051	3
flat head coupling 1 1/4" x 3/4" FIPFH X C	A-051	7
flat head coupling 1" FIPFH x 1" copper flare	A-051	12
flat head coupling 2" x 1" FIPFH X C	A-051	12
flat head coupling 1 1/2" x 1" FIPFH X C	A-051	16
piggy back nuts increaser 3/4" female copper thrd 1" flare copper	A-051	11
flat head tap adapter with 1/8 bend swivel 3/4	A-052	64
5/8" x 3/4 1/8 bend; coupling swivel nut with female Mueller coupling thread x copper flare nut	A-052	2
1/8 in bend 5/8" female coupling thread by 3/4" flare copper	A-052	9
flat head adapter with 1/8 bend swivel 1/2 x 3/4	A-052	35
flat head 1/8 bend 3/4" copper flare X 1" FIPFH	A-052	20
flat head 1/8 bend 1" IP x 1 1/4" copper flare	A-053	2
coupling 1 1/2" X 1 1/4" FIP X C 1/8 bend	A-053	8
1/8 bend 1 1/4" FIP X 1" copper flare	A-053	5
flat head coupling 1" FIPFH X 1/8 bend	A-053	9
coupling 1" x 3/4" FIP X C 1/8 bend without nut	A-053	1
assorted belts, parts and air filters	A-053	
coupling Ford 1 1/4 PEP-CTS x 1" CTS	A-054	7
coupling 1" DBL XXS x 1" copper or plastic tubing	A-054	7
coupling 3/4" x 1" FIP X CTS	A-054	1
brass nipples 1 1/4" x 2 1/2"	A-055	10
brass nipples 1 1/4" x 3 1/2"	A-055	6
brass nipples 1 1/4" x 4"	A-055	3
brass nipples 1 1/2" x 3"	A-055	4
brass nipples 1 1/2" x 4 1/2"	A-055	4
brass nipples 1 x 2 1/2"	A-055	5
brass nipples 1 x 2"	A-055	4
brass nipples 1 x 3"	A-055	6
brass nipple 2" x 4"	A-055	12
brass nipples 2" x 4 1/2"	A-055	3
brass nipples 2" x 4"	A-062	3
brass nipples 2" x 2"	A-055	2
brass nipples 2" x 2 1/2"	A-055	5
brass nipples 2" x 3"	A-055	4
brass nipples 2" x 3 1/2"	A-055	2
coupling 2" CTS quick joint by 2" CTS quick joint no lead	A-056	2
coupling 1 1/2" CTS x 1 1/2" CTS	A-056	11
coupling 2" flare copper by 2" MIP thread	A-056	8
coupling 3/4" FIP x 5/8" CTS	A-056	9
coupling 1 1/4" CTS x 1 1/4" CTS	A-056	5
coupling 3/4" MIP thread x 1/2" IP pack joint	A-057	25
coupling 1 1/4" MIP thread x 1 1/4" IP	A-057	14
coupling 1 1/4" FIP x 1" IP	A-057	9
coupling 1/2" IP x 1/2" MIP	A-057	15
coupling 1" MIP x 1" IP	A-057	15
coupling 1 1/2" MIP x 1 1/2" IP	A-058	16
coupling 1 1/4" PJ CTS x 1 1/2 CTS	A-058	2
coupling 3/4" MIP x 1" PJ IP	A-058	29
coupling 1" flare copper x 1" IP	A-058	8
PACK JOINT coupling 1" IP x 1" IP	A-058	6
2" x 3" snap clamp OD 2.38 - 3 Ford part	A-059	2

ITEM	LOCATION	INVENTORY QTY.
1 1/2' X 3" snap clamp OD 1.90 - 3	A-059	11
Smith Blair Redi Clamps 3" x 3/4"	A-059	13
Smith Blair Redi Clamps 3" x 1"	A-059	16
Smith Blair Redi Clamps 3" x 1 1/2"	A-059	14
Smith Blair Redi Clamps 3" x 2"	A-059	6
copper bends 1 1/4"	A-059	6
copper bends 1 1/2"	A-059	2
copper bends 2"	A-059	6
coupling lead ethyl 3/4" FIP x 1" XS lead (Mueller)	A-060	9
coupling lead ethyl 1" XS lead X 1" copper flare (Mueller)	A-060	2
coupling lead ethyl 3/4" FIP x 1" lead (Mueller)	A-060	10
adapter lead ethyl 1" FIP X 1 1/4" lead	A-060	17
2" unions	A-060	1
2 1/2" unions	A-060	2
3" unions	A-060	3
1 1/4 in union	A-060	0
coupling 3/4" MIP x 1" lead	A-060	1
coupling lead ethyl 3/4" IP x 1/2" XS lead	A-060	2
coupling lead ethyl 1" (S) lead X 1" (S) lead	A-060	3
straight coupling xs lead flang x FIP thread (adapter lead ethyl 3/4" FIP x 3/4" lead)	A-060	4
coupling lead ethyl 1 1/2" IP x 1 1/2" S lead	A-060	7
3/4" copper gaskets	A-061	89
2 in copper gaskets	A-061	8
1" copper gaskets	A-061	47
5/8" red gaskets	A-061	-16
3/4" red gaskets	A-061	76
brass tee 1 1/2" x 1 1/2"	A-061	1
brass tee 2 1/4" x 2 1/4"	A-061	1
brass curb box bolts	A-061	6
Bing & Tay brass curb box bolts	A-061	87
meter J brass hook bolts	A-061	53
brass nipple 3/4" x 6"	A-062	16
brass nipple 3/4" x 5"	A-062	3
brass nipple 3/4" x 4"	A-062	8
brass nipple 3/4" x 3"	A-062	6
brass nipple 3/4" x 2"	A-062	10
brass nipple 3/4" x 2 1/2"	A-062	3
brass nipple 5/8" x 2 1/2"	A-062	0
brass nipple 5/8" x 4 1/2"	A-062	1
brass nipple 1" x 6"	A-062	9
brass nipple 1" x 5"	A-062	5
brass nipple 1" x 4"	A-062	9
brass nipple 1" x 4 1/2"	A-062	6
brass nipple 1 1/4" x 4"	A-062	6
brass nipple 1 1/4" x 5"	A-062	10
brass nipple 1 1/2" x 5 1/2"	A-062	1
brass nipple 1 1/2" x 4"	A-062	4
brass nipple 1 1/2" x 5"	A-062	7
coupling 1 1/2" IP compression Silver Smith Blair	A-063	3
coupling 1 1/4" IP compression	A-063	3
coupling 2" IP compression	A-063	4
coupling 1 1/2" IP compression (525-00008400-003)	A-063	5

ITEM	LOCATION	INVENTORY QTY.
coupling 1/2" IP compression	A-063	10
coupling 3/4" IP compression	A-063	20
coupling 1" IP x 1" IP compression (525-00013200-003) SILVER	A-063	17
1 1/2" S hooks (20 per pack)	A-064	128
Mueller S hooks	A-064	20
Kennedy S hooks	A-064	398
2" S hooks (20 per pack)	A-064	310
1 1/2" copper flare tube nut	A-065	12
coupling 2" copper flare x 2" copper flare 03-077-11	A-065	3
3/4" copper flare tube nut	A-065	82
overstocks	A-066	0
brass drive plug 1/2"	A-067	167
brass drive plug 3/4"	A-067	2
brass drive plug 1"	A-067	23
brass drive plug 1 1/4"	A-067	25
brass drive plug 5/8"	A-067	20
brass drive plug 1 1/4"	A-067	0
brass screw plug 1 1/4"	A-068	84
brass screw plug 1 1/2"	A-068	25
brass screw plug 1"	A-068	34
brass screw plug 2 inch <b>NOT COPPER COMPRESSION</b>	A-068	3
brass screw plug 2 inch "CC" copper compression	A-068	15
brass screw plug 3/4" square wrench head	A-068	62
brass screw plug 1/2"	A-068	36
brass screw plug 5/8"	A-068	24
brass screw plug 1/4"	A-068	68
brass bushing 2" male AWWA taper thread x 1" female AWWA taper thread BBAA-74	A-069	5
brass bushing 2" male AWWA taper thread x 1 1/2" female AWWA taper thread BBAA-76	A-069	5
brass bushing 1 1/2" male AWWA taper thread x 1" female AWWA taper thread BBAA-64	A-069	34
brass bushing 1 1/2" male AWWA taper thread x 1" female AWWA taper thread BBAA-64	A-069	62
brass bushing 1" male AWWA taper thread x 3/4" female AWWA taper thread BBAA-43	A-069	249
reducer coupling 1" FIP x 3/4" FIP <b>NL</b>	A-070	10
reducer coupling 1 1/4" FIP x 1" FIP	A-070	10
reducer 1 x 3/4 (bell galvanized)	A-070	1
reducer coupling 1 1/2" FIP x 1" FIP	A-070	26
reducer coupling 2" FIP x 1" FIP <b>NL (os in A-073)</b>	A-070	10
brass bushing 1" FIP x 1 1/2" MIP	A-070	6
brass bushing 1 1/2" FIP x 2" MIP	A-070	5
brass bushing 1" FIP x 2" MIP	A-070	19
brass bushing 3/4" FIP x 2" MIP	A-070	14
brass bushing 1" taper thread x 3/4" taper thread	A-070	11
brass bushing 3/4" FIP x 1 1/2" MIP	A-070	8
brass bushing 3/4" FIP x 1 1/4" MIP	A-070	12
brass bushing 1 1/4" FIP x 1" MIP	A-070	31
brass bushing 1 1/4" FIP x 1 1/2" MIP	A-070	15
brass bushing 1 1/4" FIP x 2" MIP	A-070	10
overstocks	A-071	
overstocks	A-072	0

ITEM	LOCATION	INVENTORY QTY.
12 x 100 x 1 DUCT12 ductile iron dry cutting premium grade saw blades	A-073	2
coupling 1" copper flare x 1" copper flare	A-074	7
coupling 1 1/4" copper flare X 1 1/4" copper flare	A-074	4
coupling 1 1/2" copper flare X 1 1/2" copper flare	A-074	3
coupling 3/4" copper flare X 3/4" copper flare (FLARE UNION)	A-074	32
Tee 3/4" flare copper by 3/4" flare copper run by 3/4" flare copper side outlet overstock in A-072	A-074	26
Tee 1" flare copper by 1" flare copper run by 1" flare copper side outlet	A-074	6
1" DBL extra strong lead x 1" MIP thread	A-075	9
Coupling 1 1/4" MIP thread by 1 1/4 CTS pack joint	A-075	11
Coupling 1 1/4" MIP thread by 1 1/2 CTS pack joint <b>(OS A-071)</b>	A-075	15
Coupling 1 1/4" PE pipe pack joint or 1 1/4" XS lead pack joint by 1 1/4" MIP thread (C86-55 or Q28-55)	A-075	8
3/4" ball valve 3/4" flare copper by 3/4" flare copper <b>NL OS a73</b>	A-075	39
3/4" ball valve 3/4" flare copper by 3/4" FIP thread <b>NL</b>	A-075	20
COUPLING 3/4" MIP THREAD BY 1" CTS GRIP JOINT <b>(also M-271) (OS in a-073)</b>	A-076	43
coupling 3/4" MIP thread by 3/4" CTS <b>(os IN a-073)</b>	A-076	63
coupling 3/4" DBL extra strong x 3/4" copper flare (OS in A-071)	A-076	23
lead-pak coupling 5/8" extra strong lead x 3/4" MIP thread OS in A-071	A-076	24
coupling 3/4" copper flare X 3/4" PJ for CTS <b>(OS A-072)</b>	A-076	34
1/2" dbl ex strong lead (XXS) or 5/8" strong lead (S) x 3/4" copper flare	A-076	15
lead-pak coupling 3/4 extra strong lead by 3/4 MIP thread (OS-A-071)	A-076	33
lead-pak coupling 5/8 DBL extra strong lead or 3/4 strong lead by 3/4 MIP thread	A-076	13
lead-pak coupling 5/8 DBL extra strong lead or 3/4 strong lead by 3/4 flare copper	A-076	15
coupling 3/4" copper flare X 3/4" pack joint for IP OS <b>A-072</b>	A-076	27
coupling 3/4" MIP X 3/4" pack joint for IP (also M-271) <b>(OS A-066)</b>	A-076	38
lead-pak coupling 3/4 extra strong lead by 3/4 flare copper <b>NL</b>	A-076	8
lead-pak coupling 1" extra strong lead by 1" MIP thread	A-077	13
1 1/2" MIP x 1 1/2" pack joint for polyethylene pipe	A-077	16
coupling lead pak 2" (XS) LEAD X 2" MIP	A-077	18
coupling 2" FIP x 2" PJ PEP	A-077	5
lead-pak coupling 1" strong lead by 1" MIP thread	A-078	34
lead-pak coupling 1/2" DBL extra strong lead or 5/8" strong lead by 3/4 MIP thread	A-078	26
lead-pak coupling 3/4 DBL extra strong lead x 3/4 MIP thread	A-078	15
lead-pak coupling 5/8 extra strong x 3/4 flare copper	A-078	23
coupling 3/4 CTS quick joint by 3/4 CTS quick joint <b>NL</b>	A-079	22
coupling 1" CTS quick joint by 1" CTS quick joint	A-079	10
COUPLING 2" MIP THREAD BY 2" CTS QUICK JOINT <b>also in M-276 (OS in E-015 74753Q2)</b>	A-079	10
12" x .250 x 1 demolition saw blades; dry or wet cutting premium grade	A-080	8
assorted parts/couplings/pack joints	A-080	0
single flint lighter with flint refills	A-082	8
<b>GO JO</b> 10 oz <b>cherry</b> pumice hand cleaner (for trucks) <b>(OS IN d-005)</b>	A-082	18
keel/lumber crayon - yellow	A-082	68
keel/lumber crayon - red	A-082	0
orange re-usable ties (squids)	A-082	1
Borax-o pumice hand soap (bars)	A-082	0
Lava bar soap <b>(OS in D-005)</b>	A-082	42
ear plugs	A-100	195
particulate respirators 3M (N100)	A-100	41
particulate respirators 3M (N95)	A-100	23

ITEM	LOCATION	INVENTORY QTY.
<b>Dots Gloves</b>	A-100	126
Orange PVC gloves MED	A-100	10
Orange PVC gloves LRG	A-100	5
Orange PVC gloves XL	A-100	5
Orange PVC gloves 2X	A-100	4
GLOVES PVC COATED <b>BLACK</b> COTTON LINED(PR)	A-100	0
HARD HAT INSERT	A-100	17
Latex Chemical Resistant Gloves, 18 mil Thickness, Flock Lining XL Yellow	A-100	22
Neoprene/Natural Rubber Latex Chemical Resistant Gloves, 13 mil Thickness, Unlined Lining, Size 9	A-100	12
blue nitrile ambidextrous gloves box (50 pairs per box) (OS L-006)	A-100	7
ear plugs <b>NEW STYLE</b>	A-100	91
ear plugs <b>NEW STYLE</b>	A-100	-1
XL LEATHER GLOVES-GAUNTLET (PR)	A-100	0
<b>Medium</b> leather gloves - ORR Safety	A-100	0
<b>Medium leather gloves - Grainger 8/31/18</b>	A-100	
<b>LARGE</b> GLOVES LEATHER	A-100	98
<b>XL</b> GLOVES LEATHER	A-100	26
<b>DOTS GLOVES</b>	A-100	108
GLOVES COTTON KNIT (PR)	A-100	-88
GLOVES CANVAS L (PR)	A-100	0
GLOVES COTTON KNIT (PR)	A-100	0
"runny" XL leather gloves	A-100	6
<b>2X</b> Leather gloves	A-100	15
grease tubes - food grade	A-100	22
<b>lanyards for glasses</b>	A-100	24
leather 1/2 finger anti vibration gloves pr	A-100	9
two cycle saw oil 6.4 oz	A-100	0
paint brush 4 inch	A-100	45
chip paint brushes 3 inch	A-100	62
two cycle saw oil 2.6 oz	A-100	48
<b>DOW CORNING 4 ELECTRICAL INSULATING COMPOUND 5.3 OZ TUBE</b>	A-100	16
reducer 3" x 1"	B-004	5
reducer 3" x 1 1/2"	B-004	1
freeze kit with hose	B-005	1
shoe ice studs XL	A-100	0
Tap 1 1/2 x 2 (no gooseneck or flare)	B-005	3
Ford 2" CTS quick joint by 2" CTS quick joint ELL 90 <sup>0</sup>	B-005	1
2 inch copper gaskets	B-005	3
Ford 2 in TAP	B-005	1
2 inch TAP/corp stop cc thread x 1/8 bend cs cplg	B-005	4
FORD curb stop 2 in CF x 2 in CF	B-005	1
tracer wire - <500 ft roll	B-005	1
2 1/2" gate valve red - rising stem	B-005	2
1 1/2 IN tap (NO GOOSENECK OR FLARE)	B-016	5
<b>1 1/2 inch</b> corp stop/tap CC thread x 1/8 bend cs cplg <b>Mueller</b>	B-006	0
CURB STOP 1.50 CF X 1.50 FIP	B-006	3
CURB STOP 2.00 CF X 2.00 CF	B-006	1
double check back flow 2" RPZ	B-006	0
assorted brass nuts	B-008	68
boring bar assembly for Mueller A-3 machine (in tube box)	B-016	2
chain yoke	B-016	3
boring bar	B-016	3

ITEM	LOCATION	INVENTORY QTY.
Bend 45° 1 3/4" x 1 3/4" brass	B-009	6
Bend 45° 2 1/4" x 2 1/2" brass	B-009	4
Bend 45° 1 1/2" x 1 1/2" brass	B-009	5
flare copper adapter 1" x 3/4" piggy back nut (ADAPT PIGGYBACK 0.75 CF X 1.00 FCF)	B-010	15
flare copper adapter 1 1/4" x 1" piggy back nut	B-010	7
flare copper adapter 1 1/2" x 1" piggy back nut	B-010	3
Petometer tap	B-013	2
ADAPT 1.50 CF X 1.50 FIP	B-014	6
ADAPT 2.00 MIP X 2.00 CF	B-014	1
ADAPT 1.50 FIP X 2.00 CF	B-014	2
1 1/4" ball corp AWWA/cc taper thread x flare copper (straight)	B-015	0
1" x 1 1/4" corp	B-015	3
CORP TAP 1.25 AWWA X 1.25 CF BALL	B-015	4
1 1/4 in flare nuts	B-015	11
CORP TAP 1.50 AWWA X 1.50 CF BALL	B-015	0
CORP TAP 1.50 AWWA X 1.50 CF BALL with gooseneck/bend	B-015	0
<b>1 1/2 in corp stop/tap</b> Mueller	B-016	3
CURB STOP 1.25 FIP X 1.25 CF	B-016	7
CURB STOP 1.25 FIP X 1.25 FIP	B-016	18
CURB STOP 1.25 FIP X 1.25 FIP BALL	B-016	1
CURB STOP 1 1/4 IN FIP X FIP W/HANDLE	B-016	5
empty	B-017	0
empty	B-018	0
caulking anchors	B-019	50
3/4" single hole clamps	B-019	100
ADAPT 1.50 CF X 1.50 MIP	B-020	6
ADAPT 2.00 CF X 2.00 MIP	B-020	9
empty	B-021	0
empty	B-022	0
Bend 45° 2" brass	B-023	8
Bend 45° 2" brass	B-024	12
3/4 in x 1 in corp stop/tap cc thread LOW LEAD	B-025	10
flare bend for 1" tap swivel	B-025	0
flare bend for 1" tap non-swivel	B-025	4
<b>1 inch tap</b>	B-026	20
1 inch corp stop/tap - Ford	B-026	4
1 inch corp stop/tap - Ford	B-026	0
1 in curb stop	B-026	6
empty	B-027	0
empty	B-028	0
brass parts - DO NOT USE	B-029	0
Bend 45° 2" brass	B-030	15
empty	B-031	0
empty	B-032	0
empty	B-033	0
Bend 45° 1 1/2" brass	B-034	13
empty	B-035	0
empty	B-036	0
redi clamp 1 1/2 x 3	B-037	2
redi clamp 2 x 3	B-037	4
redi clamp 3/4 x 3	B-037	0
redi clamp 1 x 3	B-037	0



ITEM	LOCATION	INVENTORY QTY.
flex hose for hose monster	B-038	1
brass screw plug 2 1/2"(do not use)	B-038	5
brass screw plug 2" MIP (do not use)	B-038	15
pressure gauge for hose monster	B-038	1
<del>3/4 inch tap /corp stop 3/4 taps</del>	B-039	0
<b>3/4 in taps</b> / corp stop LOW LEAD	B-039	23
hose monster	B-040	2
2 1/2 in water lids (Bing&Tay)	B-044	28
service repair lids 2 1/2"	B-045	110
<b>48 in gasket - in white box</b>	B-046	1
3 in water lids (Bing&Tay)	B-050	17
operating wrench nut open right 2.5" - 8" for new Mueller valves	B-052	10
operating nuts	B-053	0
Canadian service box covers assorted sizes	B-054	85
service repair lids 3"	B-055	117
friction clamps 6"	B-056	0
galvanized bushings	B-057	0
operating wrench nut open right 10 - 14" for new Mueller valves	B-058	10
galvanized bushings & reducers bell style	B-058	0
large gasket	B-058	1
Victaulic gasket style E EDPM 4 inch	B-059	4
Victaulic gasket style E EDPM 6 inch	B-059	4
Victaulic gasket style E EDPM 8 inch	B-059	4
Victaulic gasket style E EDPM 10 inch	B-059	4
valve nuts old used (operating nuts)	B-060	11
galvanized bushings	B-061	0
galvanized reducers bell style	B-062	0
operating wrench nut open right 2.5" - 8" for new Mueller valves	B-062	10
empty	B-063	0
assorted gaskets	B-064	0
antique megalugs 6 inch	B-065	4
18 inch gasket	B-065	2
24 inch gasket	B-065	0
operating nuts #7	B-065	4
operating nuts #8	B-065	8
operating nuts #10	B-065	1
friction clamps 8 in	B-066	6
friction clamps 10 in	B-066	0
galvanized bends	B-067	0
galvanized screw plug 2"	B-067	1
galvanized screw plug 2 1/2"	B-067	2
galvanized reducers bell style	B-068	0
tees galvanized	B-068	0
operating wrench nut open right 10 - 14" for new Mueller valves	B-068	10
10" OMNI gaskets blue OD 11.10-11.60 Smith Blair	B-069	6
assorted gaskets	B-070	0
galvanized bushings	B-071	0
galvanized bends	B-072	0
operating wrench nut open right 2.5" - 8" for new Mueller valves	B-072	10
6" OMNI gaskets	B-073	0
4" OMNI gaskets	B-073	3
Omni 6 in end cap with 2 in outlet NPT	B-074	8

ITEM	LOCATION	INVENTORY QTY.
2 inch NPT sq head plug	B-074	17
3 inch Tyton gasket	B-075	3
3 in MJ flange with gasket	B-075	5
3 in MJ gasket	B-075	2
4 inch Tyton gasket	B-075	7
4 in MJ flanges/glands	B-076	24
4 in MJ flanges/glands with gasket	B-077	3
4 in gasket	B-077	32
4 in MJ flanges/glands with gasket and bolts	B-077	1
4 in MJ flanges/glands (round style)	B-077	4
6" OMNI cap with 2" NPT opening with gasket OD 6.90-7.22 blue Smith Blair	B-078	3
operating nuts #4	B-079	9
operating nuts #6	B-079	9
blue bolts	B-079	0
"bicycle type" chain	B-081	1
1/4 hex to 3/8	B-081	5
adjustable tap wrench	B-081	3
air gun	B-081	1
air gun chisel 12 inch	B-081	5
air gunmoil point 12 inch	B-081	7
anchor shackel 3/8"	B-081	4
Auto Cut replacement wheels	B-081	3
branches 3/8 reach 4 ft with shackels	B-081	2
channel lock <b>NO TEETH</b> 10 in tongue & groove pliers	B-081	8
chisel 3/4 inch x 7 in	B-081	12
chisel 3/4 x 12 inch	B-081	2
chisel 3/4 x 12 inch with guard ( <b>discontinue</b> )	B-081	0
chisel 5/8 inch x 7 in	B-081	10
chisel 7/8 x 12 inch	B-081	3
chisel 7/8 x 8 inch	B-081	3
chisel cold 1" x 8 inch	B-081	1
chisel long 1/2 in (IN YELLOW BOX)	B-081	6
cold chisel	B-081	2
measuring tape 25 foot - Stanley	B-081	6
torpedo level 9 inch 3 vial	B-081	4
quick acting tube cutter 1/4" - 2 5/8"	B-081	2
tube cutter 5/8" - 2 1/8"	B-081	2
anchor shackle 3/8 in screw pin type	B-081	2
8 inch slotted screwdriver 3/8 in	B-081	5
1 1/4 in socket	B-081	2
ratchet 1/2 drive 10 inch (os in I-002)	B-081	10
deep socket 1/2 drive 7/8"	B-081	1
deep socket 1/2 drive 15/16	B-081	3
deep socket 1/2 drive 1 1/4"	B-081	4
deep socket 1/2 drive 1 1/16"	B-081	1
wire stripper/cutter	B-081	4
chisel short 1/2 inch (IN YELLOW BOX)	B-081	1
cleaver	B-081	1
crescent wrench 12 inch	B-081	6
cutting wheels	B-081	9
Dagget chipping tools	B-081	3
digital caliper 8 inch	B-081	1

ITEM	LOCATION	INVENTORY QTY.
Durbin 3/8 durco-link	B-081	1
extension 5 inch 1/2 drive	B-081	5
EZ out set	B-081	0
increaser 3/8" to 1/2"	B-081	4
metal hooks	B-081	3
metal tray with various parts	B-081	1
needle nose pliers	B-081	4
New Britian bushing	B-081	1
non sparking bursting wedge	B-081	9
number engraving set	B-081	1
offset hex wrench	B-081	1
open end wrench 1 1/4 - 1 1/16 (OS in I-002)	B-081	6
open end wrench 1 1/8 - 1 1/16	B-081	0
open end wrench 3/4 - 11/16	B-081	0
open end wrench 7/8 - 3/4	B-081	1
Philips screwdriver	B-081	4
pliers	B-081	4
Pollard bursting wedge <b>large</b> 1 1/8 in	B-081	23
Pollard bursting wedge <b>small</b> 7/8 in (OS in A-066)	B-081	38
Proto acking tool 1/2 inch (IN YELLOW BOX)	B-081	4
Proto pointed cape chisel 5/8 inch (IN YELLOW BOX)	B-081	3
ratchets 10 inch 1/2 in drive ( <b>OS in D-005</b> )	B-081	7
reducers 1/2" to 3/8"	B-081	2
reducers 3/4" to 1/2"	B-081	4
reducers 3/8" to 1/4"	B-081	2
Ridgid quick acting tubing cutter 1/4 to 2 5/8	B-081	1
RIDGID TUBING CUTTER	B-081	
Ridgid regular tubing cutter 5/8 to 2 1/8	B-081	1
screwdriver 1/4 x 8 inch flat	B-081	2
screwdriver 12 in long	B-081	
shackle 1 3.8"	B-081	1
shackle 3 1/2 x 1 3/8 (clevis)	B-081	2
shackle 3/4"	B-081	1
shackle 5/8 "	B-081	2
shackle 7/16"	B-081	3
short flat screwdriver	B-081	2
small levels	B-081	7
socket deep 1 1/16	B-081	7
socket deep 1 1/4	B-081	8
socket deep 15/16	B-081	7
socket deep long 3/4	B-081	5
socket deep long 7/8	B-081	7
socket impact black long 1 1/16 (OS)	B-081	3
socket impact black long 1 1/4	B-081	12
socket impact black long 1 1/8	B-081	4
socket impact black long 1/2	B-081	6
socket impact black long 3/4	B-081	1
socket impact black long 7/16	B-081	1
socket impact black short 1 1/8	B-081	1
socket impact black short 3/4	B-081	2
socket long 1	B-081	16
socket long 1 1/16	B-081	3

ITEM	LOCATION	INVENTORY QTY.
socket long 1 1/4	B-081	1
socket long 1 1/8	B-081	7
socket long 11/16	B-081	2
socket long 13/16	B-081	14
socket long 15/16	B-081	4
socket long 3/4	B-081	1
socket long 3/8	B-081	1
socket long 5/8	B-081	5
socket long 9/16	B-081	4
socket long black impact 3/4	B-081	3
socket short 1	B-081	15
socket short 1 1/16	B-081	9
socket short 1 1/4	B-081	9
socket short 1 1/8	B-081	1
socket short 1/2	B-081	7
socket short 11/16	B-081	6
socket short 13/16	B-081	5
socket short 15/16	B-081	13
socket short 19/32	B-081	1
socket short 3/4	B-081	9
socket short 3/8	B-081	3
socket short 5/8	B-081	3
socket short 7/16	B-081	3
socket short 7/8	B-081	6
socket short 9/16	B-081	6
socket short black impact 1 1/4	B-081	1
socket short black impact 1 5/8	B-081	2
socket short black impact 15/16	B-081	1
spark plug sockets	B-081	8
Stanley 25 ft measuring tape	B-081	8
valve lifter tool	B-081	1
V-blade puller	B-081	2
vise grips	B-081	9
wire stripper/cutter	B-081	3
<b>button wrench</b> /pentagon wrench PT-CHI handle 36" length	back cage	5
Ford key - <b>TILE WRENCH</b>	back cage	1
<b>augers Kravitch</b>	back cage	5
service box cleaner (P525) spoon type cherry pickers	back cage	-1
curb/valve box cleaner 7 ft (clapper/blade+C865)	back cage	-5
7 foot mud curb & valve box cleaner	back cage	-3
sledge hammer 16 lb wood handle	back cage	3
sledge hammer 10 lb wood handle	back cage	1
sledge hammer 10 lb lime green fiberglass handle	back cage	0
sledge hammer 16 lb <b>fiberglass</b> yellow handle	back cage	4
sledge hammer 16 lb <b>fiberglass</b> yellow handle	back cage	5
sledge hammer 16 lb <b>WOOD</b> handle	back cage	4
sledge hammer 8 lb fiberglass handle	back cage	1
SHOVEL/SPADE plumber/drain spade 27 in	back cage	8
SHOVEL/SPADE plumber/drain spade 48 in (overstock basement)	back cage	10
SHOVEL/SPADE round point spade/shovel 48 inch (overstock basement)	back cage	11
SHOVEL/SPADE round point spade/shovel 27 inch	back cage	2
SHOVEL/SPADE <b>square</b> nose shovel 48 inch	back cage	9

ITEM	LOCATION	INVENTORY QTY.
weed whip wood handle (overstock basement)	back cage	6
bolt cutters large	back cage	3
bolt cutters medium	back cage	1
service box button wrench with T handle	back cage	3
long impact probe	back cage	3
service key extensions 5 ft with female hex end	back cage	2
manhole cover hook	back cage	1
turn bars	back cage	9
axe	back cage	3
<b>RAKE</b> bow <i>garden style</i> (in basement only)	back cage	4
<b>RAKE</b> bow 16 tine 60 in length	back cage	13
Mueller H-605 air power operator	back cage	4
curb stop key	back cage	-1
endless sling nylon 8 foot	back cage	2
yellow nylon sling 4 in x 22 ft yellow two ply reversed eyed	back cage	0
yellow nylon sling 4 in x 22 ft yellow two ply reversed eye from Grainger	back cage	2
long valve key 1 in square	back cage	0
turn bars w/cover opener for non-adjustable keys	back cage	12
3/8" x 6' bridle for trench box - 4 leg	back cage	2
3/8" x 3' bridle for trench box - 4 leg	back cage	2
3/4" x 5' bridle 3 leg	back cage	1
3/8" x 15' tow chain	back cage	1
3/8" x 10' tow chain	back cage	2
3/8" endless chain	back cage	1
3/8" x 10" chain with ring end for overhead lifting	back cage	1
3/8" x 20" chain with ring end for overhead lifting	back cage	1
3/8" x 3' rope bridle - 2 leg	back cage	1
1/2" x 5' chain bridle	back cage	1
K-81 HYD TOP HALF	back DOCK	2
Mueller hydrant top half OR (overstock in Taj)	back DOCK	12
Blue T-bolts 3 1/2" x 3/4"	back DOCK	
quickcrete	back DOCK	41
quickerete	<del>back dock</del>	0
hose rubber 3/4" <b>(for house to house connections)</b>	back dock	5
HYDRAFLO TRAFFIC REPAIR KITS	back wall	31
3/8 inch 3-strand Manila rope (per foot)	C-000	0
megalugs 10 inch	C-005	0
10 in MJ gasket	C-005	4
split megalugs restraint with MJ accessories 6 inch	C-006	4
split megalugs restraint with MJ accessories 8 inch	C-006	10
split megalugs restraint with MJ accessories 10 inch	C-006	2
16 inch MJ gasket	C-006	0
duc lugs (overstock C-044)	C-010	151
dog ears	C-010	0
10 in <b>RED FLANGE</b> for Omni coupling OD 10.00-10.75 w/gasket	C-013	3
10 in <b>RED FLANGE</b> for Omni coupling OD 10.00-10.75 without gasket	C-013	3
eye bolts	C-014	71
megalugs 8 inch regular (black) <b>(some in Taj)</b>	C-015	0
megalugs 8 inch oversized (gray) <b>(some in Taj)</b>	C-015	3
8 inch MJ gasket	C-015	4
8 inch MJ flange	C-015	4
12 inch plug	C-016	3

ITEM	LOCATION	INVENTORY QTY.
12 inch cap with 2 inch outlet	C-016	1
12 inch plug with 2 inch outlet	C-016	2
12 inch MJ cap	C-016	1
torque guard/KNUCKLE (Frank things)	C-020	0
8 inch Tyton gasket	C-021	1
8 in red Omni UNDERSIZE ring with gasket	C-023	
actuator nut - Wachs	C-024	0
key adapter - male union for joining keys w/dent pins	C-024	2
roll pin 3/8" x 2 1/2 inch	C-024	20
valve turning nut	C-024	4
megalugs 6 inch regular (black)	C-025	25
8 inch MJ cap with 2 in outlet	C-026	3
8 inch MJ plug	C-026	4
8 inch MJ cap	C-026	6
8 inch MJ plug with 2 in outlet	C-026	3
10 inch MJ plug	C-026	3
10 inch MJ cap	C-026	4
10 inch MJ plug with 2 in outlet	C-026	2
10 inch MJ cap with 2 in outlet	C-026	3
Slip Joint Gaskets over stock in C-021	C-027	79
4 in megalug restraint harness for DI pipe push on bells w/access	C-031	3
6 inch Star MJ swivel gland/flange (split ring)	C-034	18
megalugs 4 inch	C-035	9
megalugs 6 inch <b>oversize</b> (gray) (some n Taj)	C-035	9
4 inch MJ plug with 2" opening	C-036	6
4 inch MJ plug	C-036	8
4 inch MJ cap	C-036	7
6 inch MJ plug with 2" opening	C-036	14
6 inch MJ cap with 2" opening	C-036	15
6 inch MJ plug <b>(in aisle)</b>	C-036	6
6 inch MJ cap <b>(in aisle)</b>	C-036	12
4 in megalug restraint harness for DI pipe push on bells w/access	C-037	3
flange grey 6 in OD 7.25 - 7.65 OVERSIZE for OMNI couplings	C-038	8
oversized gaskets attached to flange OD 7.25 - 7.65	C-038	7
flange red 6 in undersize OD 6.00-6.96 for OMNI couplings	C-039	12
coupling gaskets OD 6.56 - 6.96 <b>for red flange</b>	C-039	3
coupling gaskets OD 6.28 - 6.63 <b>for red flange</b>	C-040	14
coupling gaskets OD 6.00 - 6.15 <b>for red flange</b>	C-040	9
Viega ProPress elbow 3 in 90° copper	C-041	9
Viega ProPress tee 3 x 2 copper	C-041	2
Viega ProPress elbow 3 in 45° 3 x 3 copper	C-041	2
Viega ProPress reducer 4 x 2 copper	C-042	2
Viega ProPress elbow 4 in 90° copper	C-042	4
Viega ProPress reducer 3 x 2 copper	C-042	2
Viega ProPress reducer 4 x 3 copper	C-042	2
Viega ProPress tee 4 x 4 x 2 copper	C-042	1
Viega ProPress coupling stop 3 in copper P x P	C-043	8
Viega ProPress coupling stop 2 1/2 in copper P x P OS of M-278	C-043	6
Viega ProPress coupling no stop 3 x 3 copper	C-045	6
Viega ProPress coupling stop 4 x 4 copper	C-045	8
Viega ProPress adapter 3 in C x MNPT copper	C-046	6
Viega ProPress coupling no stop 4 in copper P x P	C-046	6



ITEM	LOCATION	INVENTORY QTY.
Viega ProPress adapter 3 x 3 FPT copper	C-046	2
Viega ProPress adapter 4 in P x MNPT copper	C-047	6
<b>Mechanix</b> gloves X-LRG	C-049	0
Mechanix gloves 2X	C-049	13
Wells large gloves	C-049	5
Radnor special edition cowhide gloves MED	C-049	0
<b>Radnor</b> special edition cowhide gloves LRG	C-049	8
<b>Radnor</b> special edition cowhide gloves XLG	C-049	0
magnifier 1.5 diopter safety glasses grey lens	C-049	16
magnifier 1.5 diopter safety glasses clear lens	C-049	14
Schonstedt locators	C-049	0
megalugs 6 inch oversize (gray) also C-035	C-050	10
shoring pins	C-050	53
cotter pins for shoring pins	C-050	58
Viega ProPress reducer 1 x 3/4 copper OS of M-283 (TAJ 50 pcs)	C-051	30
Viega ProPress adapter 4 in P x FNPT copper	C-051	6
Viega ProPress elbow 3/4 in 45° (short) P X P copper replacement for 77612 in M-283 (TAJ 50 pcs))	C-052	130
Viega ProPress elbow 1 in 90° copper (replacement for 77327 in M-283 TAJ 100 pcs 2 bxs))	C-052	
Viega ProPress elbow 1 in 45° copper (replacement for 77617 of M-283 (TAJ 100 pcs))	C-052	150
Viega ProPress elbow 1 1/2 in 90° copper P x P OS of M-285 (to be replaced by 77037 in C053)	C-053	25
Viega ProPress elbow 1 1/2 in 90° copper P x P (replacement for 77337 of M-285 (TAB 30 pcs))	C-053	42
Foster Accessories 8 inch	C-054	6
Viega ProPress elbow 2 in 90° copper replacement for 77342 in M-286 (TAJ 24 pcs)	C-055	48
Viega ProPress elbow 2 in 90° copper OS of M-286 (to be replaced by 77042)	C-055	15
Viega ProPress elbow 1/2 in 90° copper OS of M-281 (TAJ 50 pcs)	C-056	120
Viega ProPress tee 3/4 x 3/4 x 1/2 copper OS of M-283 (TAJ 50 pcs)	C-056	60
Viega ProPress tee 3/4 x 3/4 x 3/4 copper OS of M-283 (TAJ 100 pcs)	C-056	88
	C-057	0
Foster Accessories 6 inch	C-058	3
Foster Fitting 4 inch	C-059	3
Foster Fitting 6 inch	C-059	4
Foster Fitting 8 inch	C-059	7
12 in regular megalugs	C-060	12
Viega ProPress cap 1 1/2 inch copper (os OF m-285) (TAJ 50 pcs-2 bx)	C-061	12
Viega ProPress tee 1 inch copper OS of M-283 (TAJ 50 pcs)	C-061	45
Viega ProPress cap 1/2 in copper (OS of M-281)	C-061	
Viega ProPress cap 3/4 in copper (OS of M-282)	C-061	
Viega ProPress adapter 3/4 x 1 bronze P x MNPT OS of M-283 (TAJ 100 pc)	C-061	50
Viega ProPress coupling stop 2 x 2 copper OS of M-286 (TAJ 20 pcs)	C-062	24
Viega ProPress coupling stop 1 1/2 x 1 1/2 copper OS of M-285 (TAJ 30 pcs)	C-062	26
Viega ProPress coupling stop 1 x 1 copper OS of M-283 (TAJ 50 pcs)	C-062	50
Viega ProPress coupling no stop 3/4 x 3/4 copper OS of M-283	C-063	216
Viega ProPress coupling no stop 2 in copper P x P OS of M-286 (TAJ 22 pcs)	C-063	30
Foster Accessories 4 inch	C-064	5
Viega ProPress adapter 1 1/2 x 1 1/4 bronze P x FNPT OS of M-285 (TAJ 20 pcs)	C-065	10
Viega ProPress adapter 1 1/4 x 1 1/2 P x MNPT bronze OS of M-284 (TAJ 50 pc)	C-065	10
Viega ProPress adapter 1 x 3/4 bronze P x MNPT OS of M-283 (TAJ 100 pc)	C-065	30
Viega ProPress adapter 3/4 x 3/4 MPT bronze OS of M-283 (TAJ 100 pc)	C-065	170
Viega ProPress adapter 1 x 1 MPT bronze OS of M-283 (TAJ 100 pc)	C-065	30

ITEM	LOCATION	INVENTORY QTY.
Viega ProPress adapter 1 1/4 x 1 1/2 P x FNPT bronze OS of M-284 <b>(TAJ 20 pcs)</b>	C-066	10
Viega ProPress elbow 1 in 90° copper OS of M-284 <b>(to be replaced by 77027)</b>	D-011	0
Viega ProPress adapter 1 1/2 x 2 bronze P x MNPT OS of M-285 <b>(TAJ 30 pcs)</b>	C-066	10
Viega ProPress adapter 2 x 1 1/2 bronze P x MNPT OS of M-278 <b>(TAJ 30 pcs)</b>	C-066	10
Viega ProPress adapter 1 1/2 x 1 1/2 MPT bronze <b>NL (REPLACES LEADED 77872 M-285) (TAJ 30 pcs)</b>	C-066	78
Viega ProPress adapter 2 x 2 MPT bronze NL OS of 77877 M-286 <b>(TAJ 30 pcs)</b>	C-067	11
Viega ProPress adapter 2 x 2 MPT bronze <b>LEADED</b> OS of M-286 ) <b>to be replaced by 79290)</b>	C-067	30
Fernco 6 in <b>plastic to plastic</b>	C-068	4
center rod puller Mueller (K81 in basement)	C-069	5
12 in regular megalugs	C-070	22
12 in gaskets	C-070	0
12 in bolt pak	C-070	0
Viega ProPress elbow 1 in 90° bronze P x F OS of M-284 <b>(TAJ 60 pcs)</b>	C-071	15
Viega ProPress adapter 1 x 3/4 bronze P x FNPT OS of M-283 <b>(TAJ 50 pcs)</b>	C-071	60
Viega ProPress adapter 1 1/2 x 1 1/2 FPT bronze <b>NL (REPLACES LEADED 77947 M-285)</b>	C-071	48
Viega ProPress adapter 1 x 1 FPT bronze NL (replaces 77917 <b>lead</b> ed in M-283) <b>(TAJ 10 pcs)</b>	C-071	48
Viega ProPress elbow 3/4 in 90° bronze PxFNPT OS of M-283 <b>(TAJ 100 pcs)</b>	C-072	35
Viega ProPress elbow 1 1/2 in 90° bronze FPT <b>OS of M-285 (TAJ 30 pcs)</b>	C-072	12
Viega ProPress adapter 2 x 2 FPT bronze NL (REPLACES 77952 IN M-286) <b>(TAJ 20 pcs)</b>	C-072	36
Viega PEXPress elbow 3/4 90° 3/4 x 3/4 bronze os of M-282	C-073	150
Viega ProPress elbow 2 in 90° FIP bronze OS of M-278 <b>(TAJ 30 pcs 2 bxs)</b>	C-073	11
Fernco 6 in <b>plastic to plastic</b>	C-074	8
Viega PEXPress tee 3/4 x 3/4 x 3/4 bronze <b>(OS of M-283)</b>	C-075	150
Viega PEXPress ProPress adapter 3/4 x 3/4 bronze Pure Flow <b>NO LEAD (OS of LEADED M-282) (TAJ 100 pcs)</b>	C-075	164
Viega ProPress coupling stop 3/4 x 3/4 copper OS of M-283	C-076	150
Viega ProPress coupling no stop 1 1/2 copper C x C OS of M-285 <b>(TAJ 30 pcs)</b>	C-076	20
Viega ProPress cap 2 inch copper (os OF m-286) <b>(TAJ 50 pcs 2 bx)</b>	C-077	22
Fernco 6 in clay to plastic	C-079	11
Fernco 4 in clay to plastic	C-079	7
Fernco 4 in PL to 4 in PL	C-079	4
Fernco 4 in clay to 4 in CI/PL	C-079	6
Fernco 6 in clay to 6 in cement	C-079	6
Fernco 6 in <b>clay</b> to 6 in <b>plastic</b> CI/PL	C-079	11
6 in CI/PL to 6 in CI/PL	C-079	7
Fernco 8 in clay to 8 in CI/PL	C-080	9
Fernco 12 in CI/PL to 12 in CI/PL	C-080	5
Fernco 8 in plastic/CI to 8 in PL/CI	C-080	3
funnel 8 inch	counter	1
saw blades 12 in ductile	counter	41
saw blades 14 in ductile - loose	counter	10
saw blades 14 in ductile - from Grainger	counter	39
baling wire coil; black annealed rebar tie wire 16 per case	counter	12
1/2 in couplings PVC 5 per box	D-001	49
1/2 in 2 hole PVC pipe straps	D-001	119
3/4 in nom. Tube insulated suspension clamp	D-001	50
nail clamp pipe 3/4 in black clips/nail hanger/TUBE TALON	D-001	98
1/2 in 90° sch 40 elbows	D-001	31
1/2 in 45° sch 40 elbows	D-001	19
1/2 in terminal adapter	D-001	15

ITEM	LOCATION	INVENTORY QTY.
<b>service clamp set</b> (2 pc per clamp set)	D-004	0
Reed socket kit for damaged nuts	D-005	0
measuring small wheel	D-005	4
ratchet 3/8 in drive	B-081	3
universal outside thread chaser	D-005	1
green black stripe hydrant pump hose 1 inch(in feet)	D-006	34
<b>service clamps</b> (2 pc per clamp)	D-010	36
SOCKET CLAMP WASHER/SQUARE	D-014	49
6 in x 3 ply 22 foot yellow slings from Grainger	D-015	2
welding and cutting outfit	D-015	2
garden hose 5/8" x 50 ft - Home Depot	D-015	1
garden hose 5/8" x 100 ft - Home Depot	D-015	1
Viega ProPress adapter 3/4 x 3/4 bronze P x FNPT OS of M-283 ( <b>TAJ 50 pcs</b> )	D-016	890
Viega MegaPress adapter female 1 inch (also in D-020)	D-019	
Viega MegaPress adapter female 1 inch (also in D-019)	D-020	
Viega ProPress adapter copper P x FNPT model 0912XL 2 1/2" x 2 1/2" NPT (OS of M-278)	D-021	
Viega MegaPress adapter female 3/4 inch	D-024	
cast brass hose 'Y' connection for backflows	D-025	15
self draining hose connection vacuum breaker 3/4 in for backflows	D-025	10
Dixon brass hydrant adapters with pin lugs female NST thread; 2 1/2 in make GHT thread; 3/4 in	D-025	10
Pollard barrels 10" x 1 1/2" red brass grade A	D-026	27
Viega PEXPress adapter 3/4 x 3/4 <b>FPT</b> bronze Pure Flow OS of M-280 ( <b>TAJ 1920 pcs</b> )	D-026	747
Viega ProPress elbow 90 copper P X P model 0916XL 2 1/2 in (OS of M-278)	D-027	
Viega MegaPress adapter male 1 inch	D-030	
Viega ProPress reducer copper P X P model 2915.2 2 in x 3/4 in (OS of M-286)	D-031	
Viega ProPress tee copper P x P model 2918 2 inch (OS of M-286)	D-031	
Viega ProPress elbow 45 copper P x P model 2926 1 1/2 inch (OS of M-285)	D-032	
Viega ProPress adapter copper P x MNPT model 0912XL 2 1/2" x 2 1/2" NPT (OS of M-278)	D-032	
Viega MegaPress adapter female 1/2 inch	D-033	
Viega MegaPress adapter male 1 inch	D-034	
3" FLANGE X 3" SWEAT	D-035	2
4" FLANGE X 4" SWEAT	D-035	2
Viega ProPress reducer copper P X P model 2915.2 1 1/2 in x 1 in (OS of M-284)	D-036	
Viega ProPress reducer copper P X P model 2915.2 1 1/2 in x 3/4 in (OS in M-284)	D-036	
Viega ProPress elbow 45 copper P x P model 2926 2 inch (OS of M-286)	D-036	
Viega ProPress tee copper P x P model 2918 1 1/2 in (OS in M-285)	D-036	
Viega MegaPress adapter male 1/2 in	D-037	
Viega MegaPress adapter male 3/4 inch	D-038	
vest safety medium Occulux - <b>SML/M Grainger</b>	D-041	6
vest safety XL Occulux	D-042	0
rain hoods	D-043	20
coverall 3X from Grainger	D-043	1
coat yellow rain coat M	D-044	2
bib yellow rain bib M	D-044	4
boot yellow rain boots 11	D-045	5
boot yellow rain boots 12 <b>K-002</b>	D-045	11

ITEM	LOCATION	INVENTORY QTY.
<b>McDonald 3/4" FNPT full port ball valve (OS of M-243, E-40 (410 in TAJ))</b>	D-046	0
overstock XL raincoats	D-047	0
overstock XL rain bibs	D-047	0
vest safety 4X Occulux	D-048	0
vest safety LRG/XL	D-049	24
coat yellow rain coat L	D-050	7
bib yellow rain bib L	D-050	3
overstock 2X rain bibs	D-051	0
vest safety 3X Utility Prowear	D-052	0
vest safety 2X/3X	D-053	26
coat yellow rain coat XL (overstock in D-047)	D-054	18
bib yellow rain bib XL (overstock in D-047)	D-054	10
boot yellow rain boots 13 <b>K-002</b>	D-055	11
boot yellow rain boots 14 <b>and basement</b>	D-055	34
Female compression adapter CTS x FNPT 3/4" CTS x 3/4" FIP <b>NO LEAD McDONALD (OS E-032 &amp; D-056 for M-271 )</b>	D-056	0
straight coupling conductive compression connection for CTS OD tubing x FIP thread 2" x 1 1/2" (OS of M-276)	D-056	
coat yellow rain coat 3X (overstock)		
bib yellow rain bib 3X <b>OS</b>	D-057	0
coat yellow rain coat 6X	D-058	2
bib yellow rain bib 6X	D-058	2
Vest safety 4XL/5XL	D-059	11
coat yellow rain coat 2X <b>(os in D-051)</b>	D-060	13
bib yellow rain bib 2X overstock D-051	D-060	9
coat yellow rain coat 5X	D-061	3
bib yellow rain bib 5X	D-061	1
vest safety Generic safety vests - asst sizes (eaches)	D-062	5
vest safety MK 5X	D-063	2
coat yellow rain coat 3X (overstock in D-057)	D-064	13
bib yellow rain bib 3X <b>OS in D-057</b>	D-064	5
boot yellow rain boots 15 <b>os basement</b>	D-065	11
boot yellow rain boots 16 <b>OS D-066, K-006, K-007 and basement</b>	D-065	84
EMPTY	D-066	0
Dupont Tempro coverall meter dept LRG	D-067	20
SMALL blue nitrile gloves	D-068	0
LARGE blue nitrile gloves	D-068	0
XL blue nitrile gloves	D-068	0
medium Tyvek suits (Herb)	D-068	25
large Tyvek suits (Herb)	D-068	25
disposable shoe covers blue one size fits most (pr)	D-069	269
blue polyethylene shoe covers - METER SHOP (eaches)	D-069	190
coat yellow rain coat 4X	D-070	9
bib yellow rain bib 4X	D-070	1
Dupont Tempro coverall meter dept XL	D-071	23
XL Tyvek suits (Herb)	D-072	24
disposable coverall white 3X	D-073	8
Dupont Tempro disposable coverall XL	D-074	2
Dupont Tempro coverall meter dept 2X	D-075	16
2X Tyvek suits (Herb)	D-076	18
disposable coverall navy XL	D-077	14
EMPTY	D-078	0
boot yellow rain boots 17 OS <b>basement</b>	D-079	21

ITEM	LOCATION	INVENTORY QTY.
boot yellow rain boots 18	D-079	7
Rainboot, size 9	D-080	2
3 foot Buffalo bars	E shelf	10
wire rope sling 3/8 in 6 foot	E-000	14
<b>McDonald brass reducing NL bushing (OS of M-279) 2 x 1 1/2 (TAJ 10 pc Pallet B)</b>	E-001	24
1 inch couplings <b>McDonald (OS for M267)</b>	E-002	48
HOSE AIR 3/8" ID x 25 FT 1/4" fitting (Multipurpose Air Hose, 3/8 In., 25 ft. L)	E-003	8
3/8 in hose end clamp	E-004	7
coupler 1/4 in	E-004	12
universal coupler male 3/4 in (OS in E-005 )	E-004	46
universal coupler male 1 in	E-004	8
universal coupler female 1/4 in	E-004	14
universal coupler hose end 3/4 inch	E-004	13
safety clips	E-004	19
meter adapters to change 1 in meter to 2 in flanged meter size & length (pairs)	E-005	10
meter adapters to change 1 in meter to 1 1/2 in flanged meter size & length (pairs)	E-005	4
brass meter flange with bolts and nuts 2 inch	E-005	4
brass meter flange with bolts and nuts 1 1/2 inch	E-005	1
3 inch Star flange adapter	E-005	6
3 inch Star grip megalug black	E-005	6
2 in x 19 in copper pipe	E-005	1
14 in diamond saw blades	E-005	15
DISCHARGE HOSE 2 IN ID X 300 FEET NEW BLUE	E-006	280
2 in gray layflat discharge hose Goodyear - Peerless	E-006	300
2 1/2 in green discharge flex hose	E-006	0
used 2 in grey discharge hose with fitting	E-006	0
2 inch black flex discharge hose	E-006	0
1 1/2 cplg quick x FIP nl ( OS of M-274) (used to be C14-66Q) <b>(TAJ 50 pc PALLET C)</b>	E-007	43
straight coupling conductive compression connection for CTS OD tubing x FIP thread 1 1/2" x 2" (OS of M-274)	E-008	
HOSE AIR 3/8" ID X 25 FT 3/8" fitting	E-009	4
universal coupler female 3/8 inch	E-010	10
universal coupler hose end 1/2 inch	E-010	18
1/2 inch hose end clamp	E-010	8
Boss clamp 1/4 inch	E-010	3
coupler 1 in	E-010	18
coupler 3/8 in	E-010	-2
3/4" steel Boss clamps (Dixon) (overstock in E-016)	E-010	#VALUE!
<b>McDonald brass reducing bushing (OS of M279) 1 x 3/4 (TAJ 48 pc Pallet B)</b>	E-011	24
<b>McDonald brass reducing bushing (OS of M279) 1 1/2 x 3/4 (TAJ 48 pc Pallet B)</b>	E-011	24
<b>McDonald brass reducing bushing (OS of M279) 2 x 3/4 (TAJ 24 pc Pallet B)</b>	E-011	24
COUPLING 1" MIP THREAD BY 1" CTS QUICK JOINT <b>McDonald (OS of C84-44 M-274)</b>	E-012	24
COUPLING 1" FIP THREAD BY 1" CTS QUICK JOINT <b>McDonald (OS of M274) (TAJ 150 pcs)</b>	E-013	39
straight coupling compression connection with set screw for use on steel pipe x FIP thread 1" x 1" <i>replaces C15-44</i> (OS of M-274)	E-013	
universal coupler female 3/4 in (OS - E-005)	E-014	52
universal coupler male 1/2 in	E-014	24
universal coupler female 1/2 inch	E-014	23

ITEM	LOCATION	INVENTORY QTY.
universal coupler female 1 inch	E-014	11
overstock Dixon 3/4" boss clamps	E-015	0
McDonald coupling 3/4" x 3/4" with set screw x FIP (for galvanized pipe) <b>(TAJ 100 pc Pallet C)</b>	E-015	450
straight coupling conductive compression connection for CTS OD tubing x MIP thread 2" x 2" <b>(replaces C84-77Q in M-276)</b>	E-015	20
coupling 3/4 in FIP x 1 in IP pack joint (OS of M-271)	E-015	0
pair adapters to change 1" meter to 1 1/2" tapped meter no lead (OS of M-273)	E-016	0
Viega PEXPress adapter 3/4 x 3/4 MPT bronze os of M-280 <b>(TAJ 400 pcs)</b>	E-016	1700
Viega ProPress elbow 3/4 in 90° copper <b>(replacement for 77322 in M-283) (TAJ 200 pcs 2 bxs)</b>	E-016	340
Viega ProPress elbow 3/4 in 90° copper OS of M-283 <b>(to be replaced by 77022)</b>	E-016	
<b>McDonald brass reducing bushing (OS of M-279) 1 1/4 x 1</b>	E-017	0
<b>McDonald brass reducing bushing (OS of M-279) 1 1/2 x 1 (TAJ 10 pc Pallet B)</b>	E-017	24
<b>McDonald brass reducing bushing (OS of M-279) 2 x 1 (TAJ 20 pc Pallet B)</b>	E-017	24
2" FIP THREAD BY 2" CTS QUICK JOINT <b>(McDonald overstock of 275) (used to be C14-77)(TAJ 150 pc Pallet C)</b>	E-018	48
Female compression adapter CTS x FNPT 3/4" CTS x 3/4" FIP <b>NO LEAD McDONALD (OS E-032 &amp; D-056 for M-271 )</b>	E-019	0
straight coupling compression connection with set screw for use on steel pipe x MIP thread 1" x 1" (OS of M-275)	E-019	
METER ADAPTERS TO CHANGE 5/8" X 3/4" METER TO 3/4" METER LENGTH <b>OS of M-273</b>	E-020	21
Dixon "Air King" washers	E-020	195
meter bushing 5/8 x 3/4 meter to adapt to 3/4" meter thread size and standard length <b>(TAJ 100 pc PALLET A)</b>	E-020	71
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030,034)</b>	E-021	150
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030, 034)</b>	E-022	150
coupling 3/4 in MIP x 3/4 in IP pack joint <b>(McDonald OS for M271 c45-33 ALSO IN m209)</b>	E-023	72
spring for jack hammer	E-024	1
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030)</b>	E-024	
repair kit for breaker gun/jack hammer	E-024	2
1 IN BLACK YOKE - Mueller	E-025	6
1 IN RED YOKE Ford	E-025	14
3/4 IN YOKE BLACK - Mueller	E-025	12
3/4 IN YOKE RED Ford	E-025	24
5/8 IN YOKE black Ford	E-025	12
5/8 in yoke red Ford	E-025	2
angle yoke ball valve for 5/8 valve 3/4 in FIP	E-025	24
RED HANDLES	E-025	2
green flex discharge hose	E-026	0
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030)</b>	E-027	200
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030)</b>	E-028	100
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030)</b>	E-029	114
tap flange 6 in x 2 in with 2 in brass screw plug	E-030	1
tap flange 6 in x 2 in	E-030	2
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E-022,024,027,028,029,030, 034)</b>	E-030	
COUPLING 3/4" FIP THREAD BY 1" CTS GRIP JOINT <b>McDonald (OS for M272) (150 more in TAJ)</b>	E-031	0
straight meter coupling conductive compression connection for CTS OD tubing x meter swivel nut 3/4" x 3/4" (OS of M-273)	E-032	0



ITEM	LOCATION	INVENTORY QTY.
adapter 1 1/4 PVC x 1 1/4 FNPT (coupling 1 1/4 FIP x 1 1/4" pack joint for IP NL) <i>replaces C15-55 (OS in E-036, 037, 032)</i>	E-032	
straight meter coupling conductive compression connection for CTS OD tubing x meter swivel nut 1" x 1" (OS of M-273)	E-032	
straight coupling conductive compression connection for CTS OD tubing x MIP thread 1 1/2" x 1 1/2" (OS of M-276)	E-033	0
ADAPTER CTS 3/4" CTS BY 3/4" MNPT QUICK JOINT <b>McDonald (OS of 271 and E- 022,024,027,028,029,030, 034)</b>	E-034	200
<b>PAIRS</b> METER ADAPTERS TO CHANGE 5/8x3/4 METER TO 1" METER SPUD SIZE AND LENGTH <b>McDonald NL (OS of M272 replaces A34) (100 pc TAJ PALLET A)</b>	E-035	48
CHANGE OVER METER COUPLING NUT FOR CHANGING 5/8" 'A' BODY STYLE COUPLING FROM 5/8" METER TO 5/8" X 3/4" METER (OS of M-273))	E-035	
adapter 1 1/4 PVC x 1 1/4 FNPT (coupling 1 1/4 FIP x 1 1/4" pack joint for IP NL) <i>replaces C15-55 (OS in E-036, 037, 032)</i>	E-036	
adapter 1 1/4 PVC x 1 1/4 FNPT (coupling 1 1/4 FIP x 1 1/4" pack joint for IP NL) <i>replaces C15-55 (OS in E-036, 037, 032)</i>	E-037	0
straight coupling conductive compression connection for CTS OD tubing x FIP thread 1 1/2" x 1" (OS of M-273)	E-038	0
brass manual hydrant pumps - Pollard	E-039	10
<b>McDonald 1" FNPT full port ball valve (TAJ 200 pcs)</b>	E-040	50
<b>McDonald 1 1/2" FNPT full port ball valve (TAJ 50 pcs)</b>	E-040	17
<b>McDonald 2" FNPT full port ball valve (TAJ 48 pcs)</b>	E-040	10
<b>McDonald 3/4" FNPT full port ball valve (also D-046, M-243 (TAJ 410 pcs))</b>	E-040	0
<b>black T-bolts with nuts 8 1/2 in x 1 in</b>	E-047	30
<b>black T-bolts without nuts 8 1/2 in x 1 in</b>	E-047	4
Brunner & Lay frost wedge 1 1/8 x 6	E-050	21
Blue T-bolts 8 1/2" x 1"	E-052	36
Blue 1 in nuts	E-052	2
Blue bolts 7" x 1" with nuts	E-056	6
Blue bolts 7" x 1" with nuts	E-057	20
asphalt cutter 7 x 5 1/2	E-060	2
asphalt cutter 12 x 3	E-060	1
asphalt cutter 5 x 5	E-060	3
asphalt cutter 6 x 5	E-060	0
Brunner & Lay Std point 1 1/8 x 6 x 14"	E-060	17
Viega PexPress tubing adapter 3/4 x 3/4 copper female Pure Flow <b>LEADED DO NOT USE</b>	E-061	34
shell cutter 8 inch	E-069	2
shell cutter sub 6 in	E-069	1
shell cutter 4 inch	E-069	3
shell cutter carbide 883 cutter 6 inch	E-069	1
shell cutter carbide 883 6 inch	E-069	1
shell cutter carbide 883 6 inch	E-069	1
Mueller shell cutter carbide 4498 8 inch	E-069	1
shell cutter with top attached 8 inch	E-069	1
shell cutter carbide 863277 10 inch	E-069	1
shell cutter carbide 889 with top attached and drill bit 10 inch	E-069	1
shell cutter 4 inch	E-069	3
<b>Brunner &amp; Lay drill rod 1" x 4 1/4" x 24", H thread</b>	E-070	37
<b>Brunner &amp; Lay 3/4 inch rock bits</b>	E-070	27
shell cutter 8 inch	E-080	2
shell cutter 10 inch	E-080	2
wire rope sling 3/8 in 3 foot	E-081	13
Grainger rags 50 lb box	F floor	1

ITEM	LOCATION	INVENTORY QTY.
Grey T-shirt cloths/rags 25 lb box	F floor	0
toilet paper rolls overstock BOXES (6 PER)	F floor	4
angle broom	F top	3
black stripping pads 20 in (5 pex bx) <b>(OS H top)</b>	F top	30
Buffing Pad White ( 5 per Box)		
broom handle screw type street brooms	F top	2
green scrubbing pads 20 in (5 per bx) <b>(OS H top)</b>	F top	24
handles wedge type FOR STREET BROOMS	F top	11
mop handle screw type for mop heads	F top	20
red buffer pads 20 in (5 per bx) <b>(OS H top)</b>	F top	25
set of appliance rollers	F top	1
tan burnish pads 20 in (5 per box) <b>(OS H top)</b>	F top	18
meter crates	F-001	0
meter crates	F-002	0
flannel cloths/rags 50 lb box	F floor	0
Spic & Span powder bleach floor cleaner (45 pks per bx)	F-003	74
drain maintainer/opener	F-004	4
Grey T-shirt cloths/rags 50 lb box	F floor	0
Tide floor cleaner (100 pk per bx)	F-004	0
Easy Paks cleaning soap packs (90 PER bucket)	F-005	17
neutral floor cleaner 50 pack	F-005	23
Sure-Pak neutral floor cleaner packets (90 per container-2 containers per box))	F-005	180
duster handles	F-006	2
Oreck vac bags	F-006	0
Scotch green scouring pads	F-006	33
scrub brushes	F-007	1
steel wool	F-007	27
toilet bowl brushes - fabric	F-007	0
urinal screen blocs	F-008	18
toilet bowl brushes - stiff bristle	F-007	1
Ridgid wet/dry vac filters	F-008	9
urinal deodorant screen	F-008	47
GoJo pumice soap 22 oz Lemon	F-010	2
GO JO dispenser	F-011	3
mop head/duster 48 in	F-011	3
sponge scrubbies	F-012	29
sponges	F-012	4
Acid toilet bowl cleaner 32 oz	F-013	15
Oreck vacuum bags (4 per)	F-013	16
Vanish toilet bowl cleaner	F-013	0
VACUUM BELTS	F-013	3
toilet paper rolls	F-014	5
ARS toilet bowl cleaner 24 oz spray <b>disc by Grainger</b>	F-015	11
CLR lime away 28 oz	F-015	24
copier paper 8 1/2 x 11 3 hole punched	F-016	3
copier paper 8 1/2 x 11 blue	F-016	1
copier paper 8 1/2 x 11 yellow	F-016	1
copier paper 8 1/2 x 14	F-016	2
copier paper 8 1/2 x 11	F-017	8
copier paper 11 x 17	F-018	10
copier paper 8 1/2 x 11	F-018	0
copier paper 8 1/2 x 11	F-019	0

ITEM	LOCATION	INVENTORY QTY.
copier paper 8 1/2 x 11	F-020	30
Krylon marking wands 34"	F-021	6
blue marking flags 4"x5" wire staff (1000)	F-022	7
orange safety flags	F-022	23
air freshner for Balcony/Filter Plant	F-023	5
Cinnamom Air Freshner 7 oz 12pks	F-023	13
crawling insect spray	F-023	12
dust mop treatment 20oz	F-023	3
metered air freshner - linen scent	F-023	5
metered dry air freshner baby powder	F-023	0
wasp & hornet killer	F-023	9
street broom heads	F-024	8
new company foaming soap	F-026	5
new company heavy duty hand scrub	F-026	3
new company tissue (C-end & D-end)	F-026	5
Clorox hand sanitizer refills	F-027	6
new company hand sanitizer	F-027	2
nozzles for Spray 9 and Spitfire	F-027	13
plastic bottles with trigger spray	F-027	21
pump for gallon bottles	F-027	3
Spitfire cleaner 32 oz Back on 10/12/18	G-003	23
Spray 9 cleaner 32 oz	F-028	31
truck wash brush head (for service area)	F-028	3
mop heads	F-029	85
disinfectant cleaner 5 gal <i>Krud Kutter gave whole thing to Kathy 1/16/18</i>	F-030	0
mop bucket press	G top	1
plastic sheeting roll (in feet)	G top	85
Toilet Paper New Rolls	G top	32
Toilet paper new rolls - <b>Office Max</b>	G top	80
trash can 3 gallon	G top	2
<b>Auto paper towels</b>	G top	4
various broom heads	G top	0
brown C-fold paper towels	G-001	0
white C-fold paper towels (packs) C-Fold Sheets New for Rest Rooms	G-001	25
ammonia 2 qt - overstock for G-004	G-002	0
scrubbing bubbles (8/CS) (locked in C-049)	G-002	7
Soft scrub 36 oz	G-002	14
degreaser gal	G-003	14
degreaser gallon - Simple Green	G-003	3
Windex Cleaner 67 oz	G-003	
glass cleaner gal Windex	G-003	2
ammonia 2 qt	G-004	28
bleach gal	G-004	4
ammonia 2 qt ( <b>overstock for G-004</b> )	G-005	0
paper towels reg - Office Max/Depot	G-007	0
paper towels brown <b>Office Max</b>	G-008	30
paper towels reg	G-008	30
garbage bags 30 x 36 <b>loose</b>	G-009	30
shrink wrap roll	G-009	1
Xlg garbage bags 38 x 58 <b>loose</b>	G-009	0
cl waste basket garbage bags (ROLLS)	G-010	53
garbage bags for rags	G-010	2

ITEM	LOCATION	INVENTORY QTY.
<u>recycling clear</u> garbage bags 20 to 30 gal	G-010	19
Xlg garbage bags 38 x 58 box (50 per box) boxes - <b>Office Max</b>	G-011	4
Xlg garbage bags 38 x 58 box (50 per box) boxes - <b>Office Max</b>	G-012	0
regular garbage bags 30 x 36 box (125 PER BOX) <b>Grainger</b>	G-013	0
regular garbage bags 30 x 36 box <b>Office Max</b>	G-013	6
paper towels reg <b>overstock</b>	G-014	0
paper towels reg <b>overstock</b>	G-015	0
Stride Citrus neutral floor cleaner 5 gallon	G-015	2
cleaner/restorer gallon	G-016	3
Neutral floor cleaner 1 gal	G-016	
floor spray buff	G-016	10
floor sealer gal	G-017	5
floor finish gallon	G-018	11
floor stripper gallon	G-019	13
Gearco 80W-90 extreme pressure gear oil gal	G-019	2
Jonseal epoxy sealer	G-020	2
nails bulk box	G-020	2
Metal cleaner gallon	G-021	1
pipe descaler	G-021	3
GO JO cherry soap refills	G-022	3
non-acid disinfectant cleaner	G-022	1
pipe descaler	G-022	-1
wire scratch brush	G-022	5
Amino 4D weed killer 5 gal	G-024	1
wire brush 13 in - <i>DISCONTINUED</i>	G-022	0
Ultra Blue grease 5 gal	G-024	1
Alpha multi surface cleaner 1.32 gal	G-025	1
Blue Beast heavy duty emulsifying cleaner	G-025	1
empty	G-025	0
Atantic State pipe joint lubricant 2 lb	G-026	1
Griffin pipe joint lubricant 2 lb	G-026	1
Loctite copper based anti seize lubricant 4 oz	G-026	9
Loctite HVAC blue pipe joint compund 4 oz	G-026	4
lubricant Tyton Joint (pint)	G-026	1
lubricant Tyton Joint qt	G-026	5
oil cans	G-027	3
empty	G-028	0
empty	G-029	0
empty	G-030	0
Enmotion paper towels <i>for automatic dispensers</i> (6 rolls - case)	G-Top	6
Xlg garbage bags 38 x 58 box (50 per box) boxes Grainger		0
yellow nylon slings	H floor	2
thread restorer 6 in to 12 in	H top	5
O-rings	H-001	#VALUE!
O-rings	H-002	#VALUE!
O-rings	H-003	#VALUE!
O-rings for 4 in - 6 in valves	H-014	#VALUE!
Mueller bonnet O-ring 4 inch	H-015	9
Mueller valve stem O-ring 4 inch valve (need 3 per stem)	H-015	30
Mueller valve stem O-ring 6 inch valve (need 3 per stem)	H-015	27
Mueller valve stem O-ring 8 inch valve (need 3 per stem)	H-015	30
Mueller valve stem O-ring 10 inch valve (need 3 per stem)	H-015	28

ITEM	LOCATION	INVENTORY QTY.
Mueller valve stem O-ring 12 inch valve (need 3 per stem)	H-015	27
Mueller valve stuffing box O-ring 4 inch valve	H-015	8
Mueller valve stuffing box O-ring 6 inch valve	H-015	7
Mueller valve stuffing box O-ring 8 inch valve	H-015	10
Mueller valve stuffing box O-ring 10 inch valve	H-015	10
Mueller valve stuffing box O-ring 12 inch valve	H-015	10
Mueller bonnet O-ring 6 inch	H-016	17
Kennedy valve stem O-ring 4 inch valve (need 3 per stem)	H-016	30
Kennedy valve stem O-ring 6 inch valve (need 3 per stem)	H-016	51
Kennedy valve stem O-ring 8 inch valve (need 3 per stem)	H-016	30
Kennedy valve stem O-ring 10 AND 12 inch valve (need 3 per stem)	H-016	30
Mueller bonnet O-ring 8 inch	H-017	10
Kennedy bonnet O-Ring for resilient gate valves 4 inch	H-017	12
Kennedy bonnet O-Ring for resilient gate valves 6 inch	H-017	16
Kennedy bonnet O-Ring for resilient gate valves 10 inch	H-017	10
Kennedy bonnet O-Ring for resilient gate valves 12 inch	H-017	10
Kennedy bonnet O-Ring for resilient gate valves 14 inch to 16 inch	H-017	2
Mueller bonnet O-ring 10 inch	H-018	11
Kennedy valve stuffing box O-ring 4 inch valve	H-018	6
Kennedy valve stuffing box O-ring 6 and 8 inch valve	H-018	19
Kennedy valve stuffing box O-ring 10 and 12 inch valve	H-018	10
Mueller bonnet O-ring 12 inch	H-019	10
O-rings for CLOW 8 in valves	H-019	#VALUE!
assorted C clamps	H-019	5
Mueller bonnet O-ring 16 inch	H-020	2
Hydra Eze sealant 18 oz ( <b>OS of I-002</b> )	H-022	0
Loctite Anti-Seize Lubricant, Food Grade, 8 oz., Temp. Range (F) 750, Specific Gravity 1.08, Film Type Liquid, Paste	H-023	14
Hydra-Eze <b>GALLONS (overstock H-024 &amp; H-026)</b>	H-023	13
Hydra-Eze <b>GALLONS (overstock)</b>	H-024	0
grinder wheels 6 x 1 x 1	H-025	18
vitrified bench grinding wheel 6 x 1 x 1	H-025	7
grinder wheel 8 x 1 x 5/8	H-025	1
grinder wheel 10 x 1 x 1	H-026	3
Hydra-Eze <b>GALLONS (overstock)</b>	H-026	0
used parts	H-028 to H-050	#VALUE!
copper bends	H-051	28
copper solid sleeve	H-052	69
copper elbows	H-052	10
copper reducer	H-053	15
copper tee	H-053	9
copper elbows	H-054	26
copper bends	H-055	13
copper solid sleeve	H-055	2
copper tee	H-056	41
copper tee	H-057	34
copper tee	H-058	39
empty	H-059	0
copper tee	H-060	11
3/4" air hose - feet (Inner diameter)	hallway	303
1/2" air hose - feet	hallway	215
flexi-flag hydrant marker 72 inches	hallway	45

ITEM	LOCATION	INVENTORY QTY.
kits for P68802	hallway	46
Fiberglas hydrant marker	hallway	0
quickcrete	hydrant room	0
pipe wrench 18 inch	I-001	3
pipe wrench 12 inch	I-001	7
lever type grease gun	I-001	2
16 inch channel locks / plier tongue/groove <b>(in metal cabinet)</b>	I-002	4
tongue & groove pliers with TEETH 12 inch	I-002	
tongue & groove pliers with <b>TEETH</b> 13 1/4 inch	I-002	4
2 1/2" fire hydrant rethreader	I-002	#VALUE!
4 oz Aviation form a gasket	I-002	3
6 ton hydraulic bottle jack	I-002	1
<b>7 inch valve box raising tool</b>	I-002	2
Black & Decker demo hammer	I-002	1
crescent wrench	I-002	1
crescent wrench 10 IN	I-002	3
crescent wrench 12/15 IN	I-002	3
crescent wrench 8 IN	I-002	0
extension cords 25 feet with triple tap	I-002	0
extension cords 50 feet (os in D-005)	I-002	6
fire hydrant pressure gauge kit <b>(os in D-005)</b>	I-002	4
hacksaws with 10 inch blades	I-002	3
hacksaws with 12 inch blades	I-002	4
hammer <b>ball pein</b> 24 oz	I-002	6
hammers claw	I-002	3
<b>black handle</b> 4 lb sledge hammer	I-002	4
hammers small sledge 3 lb <b>(caulking hammer)</b>	I-002	12
Hydra Eze sealant 18 oz <b>(OS H-022)</b>	I-002	21
HYDRANT gauge 2-1/2 100 lb Pollard	I-002	13
hydrant pressure gauge kit with case - aqua	I-002	1
levels 2 foot	I-002	4
magnetic base drill <b>(in blue metal box)</b>	I-002	0
magnetic pipe locator	I-002	2
master wrench 1 1/8 & 15/16	I-002	1
measuring tape 200 ft fiberglass open	I-002	0
Milwaukee drill chuck keys	I-002	10
MUELLER CUTTING GREASE 1 LB CAN	I-002	5
old oxygen/acetelyne hoses	I-002	1
oxygen gauge for Mig welder	I-002	1
Pollard HYDRANT gauge 2-1/2 100 lb	I-002	4
Proto combo wrenches 15/16 x 1	I-002	4
ratchet Proto 1/2 in drive 16 inches long	I-002	1
Reed copper crimper	I-002	1
riviting hammer	I-002	1
screwdriver 1/2 in x 10 inch slotted	I-002	7
screwdriver 1/2 in x 12 inch slotted	I-002	2
screwdriver flat/thin 8 inch	I-002	0
socket extension 1/2 in drive 10 in long	I-002	10
Soft Set thread sealant	I-002	4
<b>sonophones</b> / aqua phone new	I-002	10
spiral flute bridge reamer	I-002	1
TFE sealant 1 pint	I-002	12



ITEM	LOCATION	INVENTORY QTY.
thread chasers	I-002	3
2 inch strainer <b>round</b> holes	I-003	5
yellow strainers	I-003	3
crown strainers	I-003	5
small grey strainers	I-003	4
perforated cap strainers	I-003	4
2 inch strainer <b>square</b> holes	I-003	4
2 in cam x 2 in FIP	I-003	9
2 in cam x 2 in male hose	I-003	2
2 in cam/groove coupling female	I-003	3
2 in cam/groove coupling male	I-003	8
2 in king combo knurled nipple	I-003	3
4 in kamlok part F male x male	I-003	-3
4 in kamlok part B female coupler	I-003	1
strainer 4 inch	I-003	1
kamlock gasket Buna N 2 inch	I-003	10
kamlock gasket Buna N 2 1/2 inch	I-003	6
kamlock gasket Buna N 3 inch	I-003	6
kamlock gasket Buna N 4 inch	I-003	6
3 in cam & groove coupling male adapter x MNPT	I-003	6
3 in cam & groove coupling male adapter x FNPT	I-003	5
2 in male hose barb x 2 in male coupler	I-003	0
2 in male Q coupling x 2 in FIP	I-003	0
3 in male Q coupling x 3 in MIP	I-003	0
3 in female Q coupling x 3 in FIP	I-003	0
2 1/2 in female Q coupling x 2 1/2 in FIP	I-003	0
1 1/2 in hose barb x 1 1/2 in MIP	I-003	-1
1 in hose strainers	I-003	4
2 in hose strainer square openings	I-003	1
2 in hose strainers with small round holes	I-003	1
4 in hose strainer square openings	I-003	2
4 in fire nozzle x 4 in male fire hose adapter new	I-003	4
2 in MIP x 2 in male hose barb	I-003	0
3 in MIP x 3 in male hose barb	I-003	0
4 in MIP x 4 in male hose barb	I-003	0
Male Adapter x FNPT	I-003	5
Peerless 2 inch gaskets	I-003	4
Peerless 2 1/2 inch gaskets	I-003	4
2 inch knurl	I-003	13
2 inch female coupler (arm clips)( <b>os in D-005</b> )	I-003	9
2 inch male Adapter x Hose Shank	I-003	11
Dixon male hose shank camlock adapter	I-003	2
fire hose spray nozzle 1 1/2 in	I-003	5
Hydrant adapter 2.5 in NST F x 1.5 in NST M ( <b>blue</b> )	I-003	1
1 1/2 in nozzle gasket	I-003	24
2 1/2 in nozzle gasket	I-003	20
fire hose adapters	I-003	4
2 1/2 FNST x 1 1/2 MNPT hydrant adapter	I-003	8
fire hose adapters REDUCER 2 1/2 TO 1 1/2 ( <b>NPT</b> )	I-003	5
drill bit puller pieces	I-003	6
3 inch male adapter	I-003	1
3 inch Peerless gaskets	I-003	9

ITEM	LOCATION	INVENTORY QTY.
3 inch coupler F x MNPT (Mike W part <b>os IN d-005</b> )	I-003	4
3 inch diffuser	I-003	2
3 inch strainer round holes	I-003	2
3 inch strainer square holes	I-003	4
3 inch hose shank camlock adapter	I-003	1
3 inch male adapter	I-003	9
3 inch male hose shank camlock adapter	I-003	6
3 inch female camlock coupler with arms	I-003	3
3 inch female camlock coupler with arms	I-003	2
3 inch strainer round holes	I-003	3
4 inch knurls (combination pipe nipple)	I-003	4
4 inch hydrant nozzle adapter swivel (fire hose adapter)	I-003	2
Peerless 4 inch gaskets	I-003	5
4 inch female coupler (arm clips) (camlock coupler)	I-003	1
4 inch male adapter	I-003	1
4 inch hydrant nozzle adapter no swivel (fire hose adapter)	I-003	3
4 inch strainer square holes ( <b>OS a-066</b> )	I-003	5
4 inch strainer round holes	I-003	1
"checkmates" hose couplings	I-003	7
3 inch female coupler (arm clips) (hose shank camlock coupler)	I-003	5
3 inch female coupler (arm clips) (female camlock coupler)	I-003	0
3 inch female coupler (without arm clips) (female camlock coupler)	I-003	0
6 inch female coupler (arm clips) (hose shank camlock coupler)	I-003	1
5 inch female coupler (arm clips) (hose shank camlock coupler)	I-003	1
2 1/2 inch knurl (combination pipe nipple)	I-003	1
2 1/2 inch female camlock coupler (arm clips)	I-003	1
hydrant adapter 2 1/2" to 1 1/2"	I-003	4
light stand adjustable twin heads	J floor	2
6 in PVC elbow 45°	J top	0
3 in PVC coupling	J-024	1
plastic tote with used harness	J top	1
4 in PVC elbow 45°	J-024	1
Buffalo Water hard hat <b>orange SOLID</b>	J top	7
Buffalo Water hard hat white VENTED	J top	19
Buffalo Water hard hat <b>BLUE VENTED</b>	J top	0
Buffalo Water hard hat white SOLID	J top	22
Buffalo Water hard hat <b>orange VENTED</b>	J top	15
light stand adjustable twin heads	J top	1
fire extinguisher 15 lb	J-001	1
fire extinguisher 10 lb	J-001	
fire extinguisher 5 lb	J-002	0
fire extinguisher 5 lb	J-004	1
empty	J-005	0
	J-006 to J-013	0
misc used/old parts		
lead wool 5 lb bags	J-009	-2
lead wool 5 lb bags	J-010	20
commercial grinder pumps	J-014	2
light stand adjustable twin heads	J-016	0
light stand adjustable twin heads	J-017	1
light stand adjustable twin heads (Flood)	J-018	1

ITEM	LOCATION	INVENTORY QTY.
light stand adjustable twin heads	J-019	1
light stand adjustable twin heads	J-020	0
	J-021	0
measuring wheel heavy duty	J top	2
5 gallon gas can Justrite brand <b>without hose</b>	J-023	2
5 gallon gas can Justrite brand <b>WITH funnel hose</b>	J-023	-1
empty	J-025	0
USED measuring wheel heavy duty	J-025	0
SPRAYER COMPRESSED AIR 3 GAL	J-026	1
SPRAYER COMPRESSED AIR 3 GAL	J-027	2
spotlights rechargeable	J-028	0
spotlights rechargeable New Spotlights Grainger	J-029	24
spotlights rechargeable ( <b>used</b> )	J-030	1
5 gallon gas can Justrite brand <b>with hose</b>	J-031	5
garden hose	K floor	1
5 gal gas cans	K floor	4
air hose	K floor	1
Schoestedt magnetic locator	K top	5
Model K headgear (for visors)	K top	10
welding visors/shields	K top	2
head gear	K top	15
safety welding goggles	K top	5
clear visors	K top	10
vented mono goggles	K top	3
blue welding visors/shields	K top	7
fire hose double jacket 1 1/2" x 50 ft	K-001	0
fire hose double jacket 2 1/2" x 50 ft	K-001	0
fire hose	K-002	2
3/4 in x 150 ft manila rope roll	K-003	1
used extension cord	K-004	1
fire hose	K-005	4
5 gallon gas can Justrite brand	K-005	1
yellow rain boots 16 <b>os D-066, K-006, K-007</b>	K-006	
5 gallon gas can Justrite brand	K-006	0
2 gallon gas can Justrite with 5/8" hose	K-006	4
2 gallon gas can Justrite with 5/8" hose	K-007	0
yellow rain boots 16 <b>os D-066, K-006, K-007</b>	K-007	0
very large gasket	K-008	1
belts for tractor	K-008	2
lawn and garden sprayer 2 gal	K-009	1
black hose roll	K-010	1
2 gallon gas can Justrite with 5/8" hose (McManus)	K-010	5
1 gallon gas can Justrite with 5/8" hose	K-010	1
assorted rope	K-010	4
1 gallon gas can Justrite brand	K-011	0
2 gallon gas can Eagle brand	K-011	1
2 gallon gas can Justrite brand	K-011	0
1 gallon gas can Justrite with 5/8" hose	K-012	4
shoulder length helmet liner red fleece	K-021	-1
winter hoods - SHERPA LINED	K-021	25
thermal helmet liners	K-021	16
cold weather face mask/ <b>face tube</b>	K-021	24

ITEM	LOCATION	INVENTORY QTY.
RefrigiWear gloves large	K-021	26
RefrigiWear gloves ex lrg	K-021	5
Kleenex (for Wolasz) (36 in a case <b>os in L-005</b> )	K-021	
Eveready 6 volt lanterns	K-021	6
Eveready flash lights	K-021	8
disinfecting wipes canisters <b>-for Dispatch (OS in L-005)</b>	K-021	8
Lysol spray - <b>for Dispatch</b>	K-021	15
Geophone kit	K-021 top	1
paint thinner/mineral spirits 1 gallon	L-001	70
Rust-oleum rust restorer/primer	L-001	30
WHITE LITHIUM grease aerosol	L-001	10
red spray paint	L-001	23
blue spray paint <b>MARKING</b>	L-001	55
yellow spray paint	L-002	20
Safety RED <b>RUST-OLEUM</b> spray paint	L-001	33
<b>CRC lubricant</b>	L-002	35
white <b>regular</b> spray paint	L-002	9
white <b>marking</b> spray paint	L-002	11
orange flouroscent paint	L-002	15
Safety BLUE <b>RUST-OLEUM</b> spray paint - <b>new style</b>	L-002	29
Rustoleum black spray paint for plastic	L-002	5
Safety YELLOW <b>RUST-OLEUM</b> spray paint	L-002	19
Regular <b>white RUSTO-LEUM</b> spray paint	L-002	32
light blue spray paint	L-002	3
Spray On lube	L-002	4
Spray-On spray adhersive 16.75 OZ	L-002	12
NAPA rubberized undercoat 16 oz	L-002	21
calibration gas cylinders	L-003	2
<b>OSHA Safety Blue SPRAY paint</b>	L-004	2
Safety BLUE <b>RUST-OLEUM</b> spray paint	L-004	10
<b>GALLONS RUST-OLEUM - red</b>	L-004	15
<b>GALLONS RUST-OLEUM -blue</b>	L-004	10
<b>GALLONS RUST-OLEUM -white</b>	L-004	4
<del>urethane alkylid gloss enamel paint gal red</del>	<del>L-006</del>	11
<del>urethane alkylid gloss enamel paint gal BLUE</del>	<del>L-006</del>	15
<del>urethane alkylid gloss enamel paint GALLON WHITE</del>	<del>L-006</del>	10
paint can openers	L-005	19
paint stirrers	L-005	30
PROSCOPE	M floor	2
5/8 x 3/4 meters	M floor	0
50 lb pail hydraulic cement	M floor	4
MUELLER HYDRANT CENTER ROD <b>1977 TO 1986 "OLD STYLE"</b> (yellow net)	M-001	7
MUELLER HYDRANT CENTER ROD <b>1975 to 1976 "OLD STYLE"</b>	M-001	8
MUELLER HYDRANT BRASS BALATA SEAT RING	M-002	1
MUELLER O-RING #253 5 3/8 X 5 5/8 X 1/8	M-002	9
MUELLER NUT	M-002	0
MUELLER ELBOW GASKET	M-002	27
MUELLER HYDRANT CENTER ROD BALATA NUT	M-003	8
MUELLER HYDRANT SPINDLE STOP NUT	M-003	16
THERMOSEAL KLINGERSIL GASKET 4"	M-003	12
MUELLER HYDRANT SPINDLE	M-004	-9
MUELLER HYDRANT CENTER ROD TOP HALF <b>(1987-PRESENT) "NEW STYLE"</b> <i>red netting</i>	M-005	1

ITEM	LOCATION	INVENTORY QTY.
Mueller "screw top" center rods	M-005	4
MUELLER HYDRANT BALATA BOTTOM PLATE	M-006	14
MUELLER HYDRANT BTFLY DRAIN VALVE	M-006	7
Mueller balata/main valve <i>1997 or newer</i>	M-007	20
Mueller balata/main valve <i>1975 to 1996</i>	M-007	1
HydraFlo main valve	M-007	5
MUELLER HYDRANT BONNET GASKET	M-008	3
MUELLER HYDRANT SPINDLE RETAINING GLAND	M-008	3
HYDRANT OIL 10 1/2 OZ	M-008	1
MUELLER hold down nut <b>USED</b>	M-008	-17
MUELLER HYDRANT <b>2.5 inch nozzle NEW</b>	M-009	32
MUELLER HYDRANT <b>4 inch nozzle NEW (OS in B-039)</b>	M-009	8
MUELLER HYDRANT <b>2.5 inch nozzle USED</b>	M-009	4
MUELLER HYDRANT <b>4 inch nozzle USED</b>	M-009	0
MUELLER HYDRANT NOZZLE CAP 2 1/2"	M-009	4
Mueller O-Rings for 4 inch nozzles	M-009	19
HYDRANT WRENCHES	M-009	15
HYDRANT COLLARS	M-010	86
HYDRANT WRENCHES	M-010	6
EMPTY	M-011	0
MATTHEWS SHIELD OPERATING NUTS	M-012	50
MATTHEWS HYDRANT BALATA VALVE	M-013	53
MATTHEWS HYDRANT SPINDLE	M-014	0
MATTHEWS HYDRANT SPINDLE OPERATING NUT OLD	M-014	1
MATTHEWS VALVE SEAT	M-015	1
MATHEWS STOP NUT	M-015	49
MATTHEWS SHIELD OPERATING NUTS	M-016	34
MATTHEWS HYDRANT ELBOW/BARREL GASKET	M-017	103
MATTHEWS HYDRANT HEAD GASKET	M-017	0
MATHEWS HOLD DOWN NUTS	M-018	89
MATTHEWS STUFFING BOX NUTS	M-018	50
MATTHEWS HYDRANT NOZZLE 2 1/2"	M-019	7
MATTHEWS CAPS 2"	M-019	4
MATTHEWS CAPS 4"	M-019	0
MATTHEWS DRILLED OUT OPERATING NUTS	M-020	7
MATTHEWS SPINDLE & OPERATING NUT 7/16" X 2 1/2"	M-020	1
KENNEDY HYDRANT K-11 CENTER ROD TOP HALF	M-021	8
EMPTY	M-022	0
KENNEDY HYDRANT K-11 CENTER ROD COUPLING	M-023	1
KENNEDY HYDRANT K-11 CENTER ROD EXTENSION 12"	M-023	4
K-11 COUPLING PINS	M-023	0
KENNEDY HYDRANT K-11 CENTER ROD EXTENSION 6"	M-023	2
K-11 OPERATING STEM NUTS	M-024	0
KENNEDY HYDRANT K-11 GASKET BARREL CPLG	M-024	0
KENNEDY HYDRANT K-11 SPINDLE	M-024	29
KENNEDY HYDRANT K-11 SPINDLE HEAD	M-025	4
KENNEDY HYDRANT K-11 BALATA BOTTOM PLATE W/NUT	M-026	4
KENNEDY HYDRANT K-11 BALATTA TOP PLATE	M-026	6
KENNEDY HYDRANT K-11 BTFLY DRAIN VALVE	M-026	7
KENNEDY HYDRANT K-11 & K-81 BALATA VALVE	M-027	15
KENNEDY HYDRANT K-11 COPPER SEAT GASKET	M-027	130
KENNEDY HYDRANT K-11 ELBOW/BARREL GASKET	M-027	45

ITEM	LOCATION	INVENTORY QTY.
KENNEDY HYDRANT K-11 HEAD GASKET	M-027	-1
UNKNOWN	M-028	0
KENNEDY HYDRANT K-11 NOZZLE 2.5"	M-029	7
KENNEDY HYDRANT K-11 NOZZLE 4"	M-029	2
KENNEDY HYDRANT K-11 TRAFFIC REPAIR KIT	M-029	4
KENNEDY HYDRANT K-11 BARRELL CPLG TRAFFIC REPAIR RINGS ONLY	M-030	19
UNKNOWN	M-031	5
HOWARD TOP/BOTTOM FLANGES	M-032	19
HOWARD PACKING FLANGES	M-033	31
HOWARD SPINDLES	M-034	42
EMPTY	M-035	0
HOWARD GUIDES	M-036	1
HOWARD HYDRANT BALATA VALVE	M-037	17
HOWARD SPINDLES	M-038	40
HOWARD HYDRANT NOZZLE 2.5"	M-039	9
HOWARD HYDRANT NOZZLE 4"	M-039	0
HOWARD BONNETS	M-039	0
<b>Mueller 12 in disc encapsulated rwg redesign FOR RECIRC VALVE</b>	M-040	1
KENNEDY HYDRANT K-11 NOZZLE CAP 2.5"	M-040	7
KENNEDY HYDRANT K-11 NOZZLE REMOVER 2.5"	M-040	5
KENNEDY HYDRANT K-11 NOZZLE REMOVER 4"	M-040	9
EMPTY	M-041	0
K81 DIRT SHIELD	M-042	13
KENNEDY HYDRANT K-11 NOZZLE REMOVER 2.5"	M-043	-1
K81 NOZZLE REMOVING TOOLS 4" - wrench	M-043	6
K81 STEM BREAKING COUPLING	M-043	58
K81 STEM AND HEAD	M-044	4
K81 REPAIR PINS	M-044	14
K81 BALATA VALVES	M-044	0
KENNEDY K-81 SEAT O-RING SMALL	M-045	1
KENNEDY K-81 SEAT O-RING LARGE	M-045	-1
K81 BOTTOM PLATES	M-046	4
K81 OPERATING NUTS	M-046	14
K81 NOZZLE REMOVING TOOLS 2 1/2" - wrench	M-047	7
K81 NOZZLE REMOVING TOOLS 4" - wrench	M-047	0
<b>K81 MAIN VALVES/balata</b>	M-047	30
K81 center rods (stem furrules)	M-048	17
HOWARD APRONS	M-049	2
HOWARD CAPS 2"	M-049	13
HOWARD CAPS 4"	M-049	7
HOWARD APRONS	M-050	6
PEGS WOOD LARGE PLUGS	M-051	49
PEGS WOOD LARGE PLUGS	M-052	39
GREASE ZERK FITTING	M-053	343
K81 OPERATING NUTS	M-053	7
Kennedy K81 seat rings	M-054	2
K81 SS drain valve pin	M-054	30
K81 seat o-ring upper	M-054	35
K81 seat o-ring lower	M-054	35
Kennedy <b>K81 spindles</b> /operating stem nut	M-054	13
Vandal Proof Short Flat	M-055	12
vandal proofs Large New	M-056	6



ITEM	LOCATION	INVENTORY QTY.
Vandal Proof Short Flat	M-057	12
vandal proofs <b>large</b>	M-058	20
KENNEDY K-81 TRAFFIC REPAIR KITS	M-059	39
K81 stem lock nuts <b>open right</b>	M-060	3
KENNEDY K-81 <b>2 1/2 inch nozzle USED</b>	M-060	6
KENNEDY K-81 <b>2 1/2 inch nozzle new</b>	M-060	25
KENNEDY K-81 <b>4 inch nozzle USED</b>	M-060	2
KENNEDY <b>O-RINGS 2 1/2"</b>	M-060	57
KENNEDY K-81 <b>4 inch nozzle new</b>	M-060	21
KENNEDY <b>O-RINGS 4"</b>	M-060	112
KENNEDY NOZZLE <b>SET SCREWS/PLUG 1/4"</b>	M-060	182
K81 STAND PIPE BREAKING RINGS/COLLARS (pairs)	M-060	19
vandal proofs Large	M-061	7
vandal proofs large	M-062	10
vandal proofs Short Round - McGard in boxes 3 new in box	M-063	12
vandal proofs	M-063	9
vandal proofs	M-064	3
Vandal Proff Short Flat	M-065	12
vandal proofs	M-066	11
vandal proofs	M-067	12
vandal proofs	M-068	20
KENNEDY 6 in EXTENSION KIT - complete <b>new</b>	M-069	3
Kennedy shell & assembled insides extension kit	M-069	4
KENNEDY BONNETS	M-069	-1
KENNEDY RINGS	M-069	5
K 81 upper end barrell flange	M-069	11
KENNEDY BONNETS	M-070	3
KENNEDY 12 in EXTENSION KIT	M-070	7
EMPTY	M-071	0
vandal proofs	M-072	3
NOZZLE ACTION 4NH 4.750 X 6	M-073	0
4 in internal couplers for drain tile	M-073	24
vandal proofs	M-074	13
EMPTY	M-075	0
EMPTY	M-076	0
4 in snap couplers for drain tile	M-077	4
Mueller vandal proofs (need Wolasz approval to give out)	M-078	10
BONNETS K81	M-079	8
KENNEDY 12 in EXTENSION KIT	M-079	
BONNETS K81	M-080	4
KENNEDY 12 in EXTENSION KIT	M-080	
EMPTY	M-081	0
spanner wrench	M-082	0
spanner wrench	M-083	1
CHAIN VALVE LIFTER (hydrant collar with chains)	M-084	1
EMPTY	M-085	0
EMPTY	M-086	0
EMPTY	M-087	0
BOLTS STAINLESS STEEL 3 X 1/2	M-088	#VALUE!
BOLTS STAINLESS STEEL 4 X 1/2	M-088	#VALUE!
BOLTS STAINLESS STEEL 2 X 5/8	M-088	#VALUE!
flat washers 3/4 inch (45 in a box) <b>OS for A-023</b>	M-088	2

ITEM	LOCATION	INVENTORY QTY.
MUELLER 06" EXTENSION WITH KIT (on floor)	M-089	1
MUELLER 06" EXTENSION WITHOUT KIT	M-089	7
Mueller 6 inch extension stem	M-089	4
Mueller 6 inch extension stem kit with oil & rings	M-089	2
HYDRAFLO 6" KIT FOR EXTENSION	M-089	2
HYDRANT FLANGES	M-090	42
MUELLER 06" EXTENSION WITHOUT KIT	M-090	1
EMPTY	M-091	0
EMPTY	M-092	0
HYDRAFLO LUBRICATING OIL METAL 10.5 OZ CAN	M-093	38
Kennedy McGard vandal proofs ( <b>need Wolasz approval to give out</b> )	M-094	10
EMPTY	M-095	0
EMPTY	M-096	0
	M-097	0
EMPTY	M-098	
FERRY TOWER VALVE TURNER	M-099	1
HANDLE FOR VALVE KEY	M-099	1
HYDRAFLO LUBRICATING OIL METAL GALLON CAN	M-099	0
Mueller oil for CL-12 macines gallons	M-099	6
HYDRAFLO LUBRICATING OIL METAL GALLON CAN	M-100	12
<b>Hertz air tool oil/lubricant gallon ( Now from Grainger 8-30-18)</b>	M-100	9
BLUE LUBE AIR TOOL LUBRICANT/BLUE MAGIC	M-100	-1
LUBRICANT TYTON JOINT (PINT)	M-100	0
EMPTY	M-101	0
EMPTY	M-102	0
EMPTY	M-103	0
bolts zinc 3 x 1/2 (Kennedy hydrant flags) 10 per pack	M-104	638
EMPTY	M-105	0
EMPTY	M-106	0
EMPTY	M-107	0
nuts zinc 1/2 in (25 PER PACK)	M-108	1556
Hymax coupling 4" 4.25 - 5.63	M-109	10
Smith Blair 6 inch 2 bolt coupling wide range #421-06560760-031	M-109	1
VOLCLAY ADHESIVE	M-110	4
48" GASKET FOR DRESSER J-CLAMP STYLE 60	M-110	1
EMPTY	M-111	0
EMPTY	M-112	0
EMPTY	M-113	0
2" x 5/8" bolt (5 per pak)	M-114	0
freezer kits complete	M-115	4
freezer kit hoses - Pollard	M-115	8
EMPTY	M-116	0
EMPTY	M-117	0
hex cap screw 2 1/2 x 5/8 (25/bag)	M-118	21
2 1/2" x 5/8" bolt	M-118	-650
Hymax coupling 6" 6.42 - 7.68 ( <b>1 in aisle</b> )	M-119	8
Hymax coupling 6" 6.42 - 7.68	M-120	9
EMPTY	M-121	0
EMPTY	M-122	0
EMPTY	M-123	0
BOLTS 3 X 5/8 (25/bx)	M-124	-256
EMPTY	M-125	0

ITEM	LOCATION	INVENTORY QTY.
EMPTY	M-126	0
3 1/2" x 5/8 bolts <b>(25/PK) (OS in M-129)</b>	M-128	1504
hex cap screw 2 1/2 x 5/8 (25/bx)		21
Hymax coupling 8" 8.54 - 9.84 <b>(8 in aisle)</b>	M-129	11
Hymax coupling 8" 8.54 - 9.84	M-130	4
EMPTY	M-131	0
EMPTY	M-132	0
EXPANDERS	M-133	#VALUE!
5 x 5/8" bolts (25/bx)	M-134	7
EMPTY	M-135	0
EMPTY	M-136	0
1" EX FITTING	M-137	17
3/4 EX FITTING	M-137	18
expansion connection for 5/8" x 3/4" or 3/4" meter for iron yoke, yoke box and gulf box meter setting - <b>3/4 standard</b>	M-137	4
6" X 5/8" BOLTS (25/BX)	M-138	8
Hymax coupling 10" 10.7 - 12.0 <b>(2 used in aisle)</b>	M-139	4
Hymax coupling 10"	M-140	4
EMPTY	M-141	0
EMPTY	M-142	0
expansion connections 5/8 inch standard	M-143	10
expansion connections 5/8 inch wrench type	M-143	42
expansion connections 3/4 inch standard	M-143	9
expansion connections 3/4 inch wrench type	M-143	19
spacers 6 x 1 1/2	M-144	0
spacers 6 x 1	M-144	1
EMPTY	M-145	0
EMPTY	M-146	0
5/8" washers (65/bx)	M-147	2
3/4" washers (45/bx)	M-147	0
spacers 6 x 3/4	M-148	2
spacers 6 x 1/2	M-148	2
Hymax coupling 12" 12.4 - 13.66	M-149	3
COUPLING HYMAX 12 in K & S (in aisle)	M-149	
Mueller 12" hydrant extension	M-150	2
EMPTY	M-151	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; <b>1-1/4" IP THREAD PACK JOINT</b>	M-152	90
<b>6 x 2 DECK SCREWS (165)</b>	M-153	12
spacers 6 x 2	M-154	1
spacers 4 x 2	M-154	1
PACK JOINT ASSEMBLY; 3/4" KORNERHORN THREAD; 1 1/2" X 2"	M-155	103
EMPTY	M-156	0
6 X 1 DECK SCREWS (300)	M-157	15
spacers 4 x 1 1/2	M-158	2
spacers 4 x 1	M-158	14
NUTS STAINLESS STEEL 7/8	M-159	93
BOLTS STAINLESS STEEL 7/8 X 3	M-159	30
BOLTS STAINLESS STEEL 7/8 X 6	M-159	9
BOLTS STAINLESS STEEL 7/8 X 3 1/2	M-159	188
BOLTS STAINLESS STEEL 7/8 X 4	M-159	92
5/8" nuts (400/BX)	M-160	1846
5/8" nuts (25/BAG)	M-160	1

ITEM	LOCATION	INVENTORY QTY.
Bolts steel 6 x 7/8	M-160	20
stainless steel inserts 1 1/4 (OS of M-272)	M-161	0
stainless steel inserts 1 1/2 (OS of M-272)	M-161	
stainless steel inserts 2 (OS of M-272)	M-161	
3/4 ANGLE VALVE WITH KORNERHORN THREAD MALE/FEMALE	M-162	15
fine thread 3/4" x 2 21/2" bolts (20/bx)	M-163	9
fine thread 3/4" nuts (20/bag)	M-163	7
spacers 4 x 3/4	M-164	17
spacers 4 x 1/2	M-164	13
stainless steel inserts 3/4 in (OS of M-272))	M-165	0
stainless steel inserts 1 in (OS of M-272))	M-165	
3/4 VALVES IRON TO IRON kornerhorn pit valves	M-166	25
3/4 VALVES IRON TO IRON	M-167	70
spacers 3 x 2	M-168	2
spacers 3 x 1	M-168	12
NUTS STAINLESS STEEL 3/4 (250/bx)	M-169	7
BOLTS STAINLESS STEEL 3/4 X 3	M-169	0
BOLTS STAINLESS STEEL 3/4 X 3 1/2	M-169	120
tap flange 6 in x 3 in	M-169	4
BOLTS STAINLESS STEEL 1/2 X 2 (50/bx)	M-170	6
MUELLER D4 DRILLING MACHINE	M-170	2
YELLOW METAL BOX Wachs pipe alignment protractor	M-170	1
wall brackets	M-170	2
clamps	M-170	2
EMPTY	M-171	0
unknown	M-172	7
good for both 1" copper 3/4" iron fitting	M-172	
1" VALVES	M-173	49
spacers 3 x 3/4	M-174	9
spacers 3 x 1/2	M-174	13
MISC PARTS	M-175	0
MISC PARTS	M-176	0
MISC PARTS	M-177	0
reducing flanges	M-178	10
6 x 2 spacer	M-178	2
BACKFLOW PARTS	M-179	#VALUE!
ELECTRIC PARTS CLEANER MACHINE IN A RED BOX	M-180	1
valve seat reamer part for lathe assenbly in wooden box	M-180	1
3/4" KORNERHORN THREAD X 1 1/2" PJ FOR CTS	M-181	68
3/4" KORNERHORN THREAD X 1 1/2" PJ FOR CTS	M-182	22
bantam plug 10-12 x 1 plastic screw anchor ( <b>mollies 100</b> )	M-183	63
reducing flanges	M-184	12
flange threaded sz 2 1/2"L 7 in - NPT	M-184	2
Viega ProPress adapter copper/steel flange P x flange #0959.5XL 2 1/2 in	M-185	5
Viega ProPress adapter flange 3 in copper	M-186	6
3" gasket	M-187	81
cable clips (25 per bag)	M-187	267
3" uni-flange (includes back wall stock)	M-188	54
WRENCH SET CHROME ADJUSTABLE 6", 8" 10"	M-189	1
HANDLE HINGE 1/2 DR 18-5/8 for sockets	M-189	1
ORANGE TOOL BOX WITH SOCKET SET & WRENCHES	M-189	1
METRIC SOCKET SET 1/2 DR 6 PT 23 PC	M-189	1

ITEM	LOCATION	INVENTORY QTY.
Ridgid 3/4 - 2" pipe cutter for parts	M-189	1
DEWalt 20V BATTERIES	M-189	0
HACKSAW LENOX	M-189	3
Wheeler Rex cutting tool	M-189	1
GREY METAL TOOL BOX WITH SOCKETS, RACHETS, ETC	M-189	1
BLACK & DECKER IMPACT WRENCH KIT ELECTRIC	M-189	1
BOSCH CORDLESS HAMMER	M-189	1
SOCKET SET PROTO 1/2 DR 18 PC 6 PT	M-189	1
MILWAUKEE SAWZALL RED METAL BOX	M-189	1
Ridgid 4 wheel pipe cutter SS	M-189	1
BLUE BOX WITH BOSCH ELECTRIC RECIPROCATING SAW WITH BLADES	M-189	0
RED BOX HILTI ELECTRIC DRILL TE 15-C	M-189	0
very old tapping machine	M-190	1
Wheeler hydraulic cast iron snapper	M-190	1
Viega ProPress adapter flange 4 in copper	M-191	5
ductile iron grooved couplings 3 inch	M-192	4
ductile iron grooved couplings 4 inch	M-192	4
ductile iron grooved couplings 6 inch	M-192	1
ductile iron grooved flange 3 inch	M-192	2
ductile iron grooved flange 4 inch	M-192	2
	M-192	1
4" flange gaskets	M-193	77
4" uni-flange (includes back wall stock)	M-194	80
EMPTY	M-195	
EMPTY	M-196	0
6" flange gaskets	M-197	69
6" UNI-FLANGES (includes back wall stock)	M-198	66
4w30	M-199	2
3/4 IMP <b>SPLIT RING HANGER</b> 3/8" ROD CT138R COPPER	M-199	96
3/4 #500 TUBE STRAPS COPPER CLAD 2 HOLE 7/8" OD	M-199	200
3/8 ROD COPPER MI CEILING/ <b>WALL PLATE</b> /FLANGE CT128R	M-199	94
BATTERY 12 VOLT FAST CHARGE 1 HOUR	M-199	2
BRUSHES 1" CARBON STEEL ID HARD HEAD FITTING MIL ROSS	M-199	11
COPPER WIRE SPOOLS	M-199	19
METER PIT COVER KEY	M-199	1
2 inch band coupling	M-199	1
Pollard cylinder valve adapter	M-199	5
lanyard 5/8 nylon 50 feet	M-199	1
bucket organizers	M-199	3
Irwin drill bits	M-199	18
1/4" DeWalt drill bit	M-199	1
some kind of power C709bit	M-199	18
Westward pocket magnet pick up	M-199	8
Milwaukee 11 in 1 screwdriver (disc by Grainger)	M-199	1
Klein 11 in 1 screwdriver	M-199	1
DeWalt 16 piece drill bit set	M-199	2
Westward 8 inch diagonal cutter	M-199	1
rotary chuck driver	M-199	1
putty knife 1 1/2 inch	M-199	0
Lenox plastic/PEX pipe cutter	M-199	1
tapered faucet seat wrench	M-199	5
1/2 DR IMP UNIV JOINT 1/2 X 1/2	M-199	1

ITEM	LOCATION	INVENTORY QTY.
PROTO SCRAPPER	M-199	0
tongue and groove pliers ( <b>WISE GRIPS</b> ) 10 in	M-199	2
tongue and groove pliers ( <b>WISE GRIPS</b> ) 12 in	M-199	0
multi bit screwdriver 11 in 1	M-199	7
pipe cutter 3/4 inch silver	M-199	2
grip 10 cutter/striper	M-199	2
lineman's pliers 8 inch black	M-199	6
automatic center punch 1/2 d x 5 l	M-199	6
adjustable compartment box translucent	M-199	6
Ridgid spud wrench #12 2 5/8" capacity 11 inch	M-200	0
REED CUTTING MACHINE RED METAL BOX	M-200	1
dry filter oiler for Reed machine	M-200	1
CLAMP WORK LIGHT QUARTZ HALOGEN 150 WATT	M-200	1
DROP CLOTH CANVAS	M-200	1
RIDGID OFFSET HEX WRENCH	M-200	1
hacksaw 17-3/4 in	M-200	3
Stanley screwdriver 6 pc set	M-200	4
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1/2" CTS PACK JOINT (OS of M-275)	M-201	0
3/4" GASKETS/WASHERS	M-202	#VALUE!
8" FLANGE GASKETS	M-203	74
8" UNI-FLANGE	M-204	9
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-205	30
METER FLANGE RESETTER GASKETS ASSORTED	M-206	178
COUPLING 2" METER FLANGE ADAPTER BY 2" FIP THREAD	M-207	6
2" FLANGE GASKETS	M-207	#VALUE!
METER FLANGE COUPLING 1 1/2" METER FLANGE BY 1 1/2 FIP THREAD	M-208	11
1 1/2" FLANGE GASKETS	M-208	2
Viega MegaPress jaw set 1/2" through 1" <b>for Wolasz ONLY</b>	M-209	
1/2 in couplings PVC (overstock of M-282) 5 per box	M-209	0
COUPLING 3/4" CTS pack joint X 3/4"IRON PIPE PACK JOINT overstock of 271	M-209	0
coupling 3/4 in iron pipe pack joint X 1 in iron pipe pack joint (overstock of M-272)	M-209	0
COUPLING 3/4 INCH IP PJ X 3/4 INCH PJ FOR IRON PIPE (overstock of M-272)	M-209	0
Viega PEXPress adapter 1/2" PEX x 3/4" female NL	M-209	0
OS of M-274	M-209	0
COUPLING 1" FIP THREAD BY 1" CTS QUICK JOINT (overstock of M-274; McDonald E-013-74754Q1)	M-209	0
COUPLING 1 1/2" FIP THREAD BY 1 1/2" CTS QUICK JOINT (overstock of 274 McDonald)	M-209	0
STRAIGHT COUPLING 1 INCH MIP X 3/4 INCH IP PJ- (overstock of M-274)	M-209	40
2" FIP THREAD BY 2" CTS QUICK JOINT (overstock of E-018, M-275)	M-209	0
coupling 3/4" FIP x 3/4" PVC pipe pack joint (overstock of M-276)	M-209	18
coupling 3/4" MIP x 3/4" PVC pipe pack joint (overstock of M-276)	M-209	18
Stanley claw hammer	M-210	7
magnetic tip tape measure 1 in	M-210	7
wide mouth tool bag	M-210	7
Stanley wrecking bar 24 inch	M-210	7
cordless work ligh DeWalt	M-199	1
Dewalt Impact ready driver set 1/4 in drive 38 piece set	M-210	6
wire/cable staple gun	M-210	8
Ridgid midget tube cutter model 104	M-210	6
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-211	80



ITEM	LOCATION	INVENTORY QTY.
5/8 gaskets - washers	M-212	0
1 inch gaskets/washers	M-213	0
5/8 gaskets - washers	M-214	0
3/4 gaskets - washers	M-214	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-215	72
5/8 gaskets	M-216	0
1 1/2 inch gaskets/washers	M-217	0
2 inch gaskets/washers	M-217	
unknown ell part number L84-34-G	M-218	7
ELL 1" MIP THREAD BY 1" CTS GRIP JOINT (L84-44-G)	M-218	5
L44-34-G unknown	M-218	6
bolt and wheel for yoke	M-218	#VALUE!
1 1/2 inch regular registers	M-219	
1 1/2 inch EC pit registers with antenna	M-219	
1 1/2 inch regular meters	M-219	0
gate valve brass 3/4 in FNPT non-rising OVERSTOCK of M-243	M-220	240
pit wire seals - pit installation kits	M-220	
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-221	76
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-222	88
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-223	88
CABLE TIES 18 IN (in packs)	M-224	12
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-225	76
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-226	88
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-227	88
2" X 18" GALVANIZED NIPPLES	M-228	11
CABLE TIES 7.9 IN (100 PER PACK)	M-228	22
<b>register pins and Scotch clips</b>	M-228	#VALUE!
Scotch locks	M-228	
1 inch regular meters	M-229	0
3 inch registers	M-229	0
couplings 1 inch McDonald <b>OS of M-267</b>	M-230	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-231	76
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-232	88
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; <b>1-1/2" IRONPIPE THREAD PACK JOINT</b>	M-233	75
1 inch register	M-234	1
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD; 1-1/2" IRONPIPE THREAD PACK JOINT	M-235	80
dynabolt sleeve anchor 3/8" x 1 7/8" (50/bx)	M-236	4
1/2 in full port valve	M-237	150
gate valve 1/2 inch McDonald	M-237	91
empty	M-238	0
3/4 inch regular meters	M-239	0
1 inch pit EC registers with antenna	M-240	
3/4 inch registers	M-240	0

ITEM	LOCATION	INVENTORY QTY.
extra antenna	M-240	
3/4" WATTS BRASS GATE VALVE IPS THRD 200 WOG	M-243	1
3/4" BALL VALVE PAD WING; 3/4" FIP THREAD BY 5/8" X 3/4" & 3/4" METER-SWIVEL NUT	M-243	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-241	260
gate valve /brass 3/4 in FNPT non-rising OVERSTOCK in M-220	M-243	6
<b>McDonald 3/4" FNPT full port ball valve (OS D-046, E-40 (TAJ 410 pcs))</b>	M-243	1027
5/8 registers pits	M-244	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-245	260
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-246	80
1" WATTS BRASS GATE VALVE IPS THRD 200 WOG	M-247	
<b>McDonald 1" FNPT full port ball valve (OS E-040 (TAJ 200 pcs))</b>	M-247	227
5/8 pit registers	M-248	95
3/4 in regular registers	M-249	
EC antenna only	M-249	0
EC antenna pit 20 ft wire	M-250	
TOUCH PADS	M-250	0
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-251	240
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-252	240
<b>McDonald 1 1/2" FNPT full port ball valve (OS E-040 (TAJ 50 pcs))</b>	M-253	86
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT - primary</b>	M-254	4
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-255	240
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-256	80
<b>McDonald 2 FNPT full port ball valve (OS E-040 (TAJ 48 pcs))</b>	M-257	56
<b>3/4" PACK JOINT ASSEMBLY CTS QUICK JOINT (OS M-264)</b>	M-258	330
METER CONNECTION NUT SEAL 3/4 IN LIGHT GREEN (EACH)	M-260	-602
2 inch EC pit registers with antenna	M-259	
radio reads EC pit white label	M-259	
radio reads wall mount regular	M-259	0
METER CONNECTION NUT SEAL 1 IN LIGHT GREEN (2 per set)	M-260	409
METER CONNECTION NUT SEAL 3/4 IN LIGHT GREEN (2 per set)	M-260	903
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1" CTS <b>PACK JOINT</b>	M-261	120
COUPLING 2.875" LONG; 1 1/2" METER SWIVEL NUT BY 1 - 1/2" MIP THREAD 1 1/2 inch (overstock McDonald floor furnace)	M-263	11
empty	M-262	0
3/4 in couplings <b>McDonald NO LEAD</b>	M-264	0
3/4 in couplings <b>McDonald NO LEAD</b>	M-264	-20
<b>1 1/2" couplings McDonald (OS on floor by furnace) (TAJ 150 pc PALLET A)</b>	M-263	225
<b>3/4" PACK JOINT ASSEMBLY CTS QUICK JOINT (OS of M-258)</b>	M-264	
Lock City 3/4 inch couplings	M-263	0
Vellano 3/4 couplings	M-263	0
2 in couplings McDonald NO LEAD (OS on floor by furnace) (TAJ 173 pc PALLET A)	M-265	303
2 in couplings McDonald NO LEAD	M-266	0
1 inch COUPLING OS in M-230 (TAJ 150pc PALLET A)	M-267	537
1/2 coupling	M-268	27

ITEM	LOCATION	INVENTORY QTY.
5/8 coupling X 1/2 WITH WASHER	M-268	204
radio reads EC pit yellow label with antenna	M-269	0
read reads EC pit yellow label NO antenna	M-269	
RADIO READS MOUNT ( EC WITH YELLOW LABELS )	M-270	
COUPLING 3/4" FIP THREAD BY 3/4" IP PACK JOINT <b>FORD</b>	M-271	-65
3/4 in couplings <b>McDonald</b> NO LEAD	floor	1862
coupling 3/4" x 3/4" with set screw x FIP (for galvanized pipe) (os E-015)(TAJ 100 pc Pallet C)	M-271	445
compression male copper (OS E-022, 024,027,028,029, 030, 034) (TAJ 100 pc PALLET A)	M-271	1152
OLD STYLE coupling 3/4" IP x 3/4" FIP <b>NO LEAD McDONALD</b>	M-271	18
coupling 3/4 in FIP x 1 in IP pack joint ( <b>OS in E-015</b> )	M-271	45
Female compression adapter CTS x FNPT 3/4" CTS x 3/4" FIP <b>NO LEAD McDONALD (OS E-032 and D-056 ) (TAJ 1000 pc)</b>	M-271	1266
coupling 3/4" CTS x 3/4" FIP <b>NO LEAD McDONALD os in E-015, E-022 (OLD STYLE IN e-008)</b> <b>Galvanized Compression coupling</b>	M-271	77
COUPLING 3/4" CTS pack joint X 3/4" IRON PIPE PACK JOINT (os IN m-209)	M-271	39
COUPLING 3/4" MIP THREAD BY 1" CTS GRIP JOINT (also in A-076)	M-271	1
3/4 galvanized compression male (also in A-076)	M-271	12
ELL 3/4" MIP THREAD BY 3/4" CTS GRIP JOINT	M-271	3
PACK JOINT ASSEMBLY NO. 1 FEMALE KORNERHORN THREAD BY 3/4" MIP THREAD	M-271	21
COUPLING 3/4" FIP THREAD BY 1" CTS GRIP JOINT ( <b>replaced by 74754Q1x3/4</b> )	M-272	13
stainless steel inserts 1 1/2 ( <b>OS in M-161</b> )	M-272	200
stainless steel inserts 1 1/4 ( <b>OS in M-161</b> )	M-272	56
stainless steel inserts 1 in ( <b>OS in M-165</b> )	M-272	180
stainless steel inserts 2 ( <b>OS in M-161</b> )	M-272	148
stainless steel inserts 3/4 in ( <b>OS in M-165</b> )	M-272	150
ADAPTER 3/4" FIP THREAD BY 1" CTS GRIP JOINT ( <b>OS in E-031 150 in TAJ</b> )	M-272	161
<b>PAIRS</b> METER ADAPTERS TO CHANGE 3/4 METER TO 1" METER SPUD SIZE AND LENGTH (OS E-035 McDonald 710J24) ( <b>100 pc TAJ PALLET A</b> )	M-272	212
coupling 3/4 in iron pipe pack joint X 3/4 in iron pipe pack joint ( <b>OS in M-209</b> )	M-272	63
coupling 3/4 in iron pipe pack joint X 1 in iron pipe pack joint (overstock in M-209)	M-272	40
3/4" FIPT x 3/4" meter swivel nut	M-272	8
3/4" angle key valve, padwing 3/4" flare copper x 5/8 x 3/4" & 3/4" meter swivel nut	M-272	4
pair adapters to change 1" meter to 1 1/2" tapped meter no lead ( <b>OS in E-016</b> )	M-273	48
straight meter coupling conductive compression connection for CTS OD tubing x meter swivel nut 1" x 1" ( <b>OS in E-032</b> )	M-273	25
straight meter coupling conductive compression connection for CTS OD tubing x meter swivel nut 3/4" x 3/4" ( <b>OS in E-032</b> )	M-273	100
coupling 1 1/4 FIP x 1 1/4" pack joint for IP NL ( <b>OS in E-036, 37</b> )	M-273	102
adapter 1 1/4 PVC x 1 1/4 FNPT (coupling 1 1/4 FIP x 1 1/4" pack joint for IP NL) <b>replaces C15-55 (OS in E-036, 037, 032)</b>	M-273	100
straight coupling conductive compression connection for CTS OD tubing x FIP thread 1 1/2" x 1" ( <b>OS in E-038</b> )	M-273	30
METER ADAPTERS TO CHANGE 5/8" X 3/4" METER TO 3/4" METER LENGTH <b>OS in E-020 McDonald 710J23</b>	M-273	49
CHANGE OVER METER COUPLING NUT FOR CHANGING 5/8" 'A' BODY STYLE COUPLING FROM 5/8" METER TO 5/8" X 3/4" METER ( <b>OS E-035</b> )	M-273	115
3/4" IP BY 3/4" P.J. FOR IRON PIPE (2 PER KORNERHORN)	M-273	23
lead pak coupling 5/8" DBL extra strong lead or 3/4" strong lead by 3/4" CTS pack joint (OS E-035)	M-273	25

ITEM	LOCATION	INVENTORY QTY.
straight coupling compression connection with set screw for use on steel pipe x FIP thread 1" x 1" <b>replaces C15-44 (OS in E-013)</b>	M-274	13
straight coupling conductive compression connection for CTS OD tubing x FIP thread 1 1/2" x 2" <b>(OS in E-008)</b>	M-274	20
COUPLING 1" FIP THREAD BY 1" CTS QUICK JOINT <b>(OS E-013) (TAJ 150 pcs Pallet C)</b>	M-274	175
coupling 3/4" female copper thread by 3/4" iron pipe pack joint	M-274	6
COUPLING 1 1/2" FIP THREAD BY 1 1/2" CTS QUICK JOINT <b>(replaces C14-66 OS in E-007) (TAJ 50 pcs)</b>	M-274	51
coupling 1 1/4" FIP thread x 1 1/4" CTS quick joint	M-274	15
COUPLING 1 1/2" FIP THREAD BY 1 1/2" CTS QUICK JOINT <b>(replaces C14-66 and C15-66 OS in E-007) (TAJ 50 pcs)</b> with set screw	M-274	3
COUPLING 1 1/2" FIP THREAD BY 1 1/2" IP PACK JOINT <b>(OS in M-209)</b>	M-274	0
COUPLING 1" MIP THREAD BY 1" CTS QUICK JOINT <b>(McDonald 74753Q1 OS E-012)</b>	M-274	30
STRAIGHT COUPLING 1 INCH MIP X 3/4 INCH IP PJ- <b>overstock in M-209</b>	M-274	14
straight coupling compression connection with set screw for use on steel pipe x MIP thread 1" x 1" <b>(OS in E-019)</b>	M-275	10
2" FIP THREAD BY 2" CTS QUICK JOINT <b>(OS in E-018 Mc 74754Q2)(TAJ 150 pc Pallet C)</b>	M-275	171
COUPLING 2" FIP THREAD BY 2" IP PACK JOINT with set screw	M-275	12
COUPLING 2" MIP THREAD BY 2" IP PACK JOINT	M-275	10
PACK JOINT ASSEMBLY; NO. 1 FEMALE KORNERHORN THREAD BY 1/2" CTS PACK JOINT <b>(OS in M-201)</b>	M-275	25
straight coupling conductive compression connection for CTS OD tubing x MIP thread 1 1/2" x 1 1/2" <b>(OS in E-033)</b>	M-276	30
adapter anode CTS x MNPT 1 1/2 x 2	M-276	20
straight coupling conductive compression connection for CTS OD tubing x FIP thread 2" x 1 1/2" <b>(OS in D-056)</b>	M-276	20
bushing meter coupling 2" female iron pipe x 2" male meter thread	M-276	8
coupling 3/4" FIP x 3/4" PVC pipe pack joint <b>(OS in M-209)</b>	M-276	18
COUPLING 2" MIP THREAD BY 2" CTS QUICK JOINT <b>also in A-079 (OS in E-015 74753Q2)</b>	M-276	4
coupling 3/4" MIP x 3/4" PVC pipe pack joint <b>(OS in M-209)</b>	M-276	14
<b>pairs</b> meter adapters to adapt 1" meter to 2" tapped meter size & length	M-276	8
unknown	M-276	45
pull elbow 1 piece 1/2 in PVC	M-277	4
Ferrule, CPI(R), Tube Size 1/2 In	M-277	10
Power Wrap pipe repair	M-277	3
hex bushing 2 1/2 x 2 galvanized	M-277	3
dolphin sealant wire connectors (4KED1)	M-277	31
abrasive brown pads	M-277	6
sealing gum	M-277	1
Rector seal pipe thread sealant 8 oz can	M-277	6
1/2" IP thread cap - galvanized	M-277	20
3/4" IP thread cap - galvanized	M-277	27
1/2" IP thread plug - galvanized	M-277	13
3/4" IP thread plug - galvanized	M-277	19
locknut conduit steel 1/2 in	M-277	50
1/4" IP thread cap - galvanized	M-277	1
1" IP thread cap - galvanized	M-277	2
1/4" IP thread plug - galvanized	M-277	2
1" IP thread plug - galvanized	M-277	3
Arrow T25 staples 7/16 round crown (1000/bx)	M-277	2
split ring pipe hanger copper colored	M-277	3
1/2 in PVC electrical junction box (E985D)	M-277	2

ITEM	LOCATION	INVENTORY QTY.
Viega ProPress adapter 2 x 1 1/2 bronze P x MNPT OD in C-066 <b>(TAJ 30 pcs)</b>	M-278	32
Viega ProPress elbow 2 in 90° FIP bronze OS in C-073 <b>(TAJ 30 pcs 2 bxs)</b>	M-278	32
Viega ProPress elbow 90 copper P X P model 0916XL 2 1/2 in (OS in D-027 )	M-278	5
Viega ProPress reducer copper XL-C P X P model 0915.2XL 2 1/2 in x 2 in	M-278	5
Viega ProPress coupling stop 2 1/2 copper P x P OS in C-043-6	M-278	2
Viega ProPress adapter copper P x FNPT model 0912XL 2 1/2" x 2 1/2" NPT (OS in D-021)	M-278	10
Viega ProPress adapter copper P x MNPT model 0912XL 2 1/2" x 2 1/2" NPT (OS in D-032)	M-278	10
Viega ProPress reducer copper XL-C P X P model 0915.2XL 3 in x 1 1/2 in	M-278	5
BRASS BUSHING HEX 3/4" X 1/2"	M-279	10
BRASS BUSHING HEX 1" X 1/4" <b>(OS McDonald E-017)</b>	M-279	11
BRASS BUSHING HEX 1" X 3/4" <b>(24 in OS McDonald E-011) (TAJ 48 pc Pallet B)</b>	M-279	21
BRASS BUSHING HEX 1 1/4" X 3/4"	M-279	22
BRASS BUSHING HEX 1 1/4" X 1" <b>(TAJ 20 pc Pallet B)</b>	M-279	18
BRASS BUSHING HEX 1 1/2" X 3/4" <b>(24 in OS McDonald E-011) (TAJ 48 pc Pallet B)</b>	M-279	39
BRASS BUSHING HEX 1 1/2" X 1" <b>(24 in OS McDonald E-017) (TAJ 10 pc Pallet B)</b>	M-279	23
BRASS BUSHING HEX 1 1/2" X 1 1/4"	M-279	11
BRASS BUSHING HEX 2" X 3/4" <b>(24 in OS McDonald E-011) (TAJ 24 pc Pallet B)</b>	M-279	48
BRASS BUSHING HEX 2" X 1" <b>(24 in OS McDonald E-017) (TAJ 20 pc Pallet B)</b>	M-279	23
BRASS BUSHING HEX 2" X 1 1/4"	M-279	13
BRASS BUSHING HEX 2" X 1 1/2" <b>(24 in OS McDonald E-001) (TAJ 10 pc Pallet B)</b>	M-279	24
Viega PEXPress adapter 3/4 x 3/4 MPT bronze (90541) os in E-016	M-280	71
Viega PEXPress adapter 3/4 x 3/4 <b>FPT</b> bronze Pure Flow OS ALL in D-026 <b>(TAJ 1920 pcs)</b>	M-280	2660
Viega ProPress elbow 1/2 in 90° copper OS in C-056 <b>(TAJ 50 pcs)</b>	M-281	52
Viega ProPress elbow 1/2 in 45° 1/2 x 1/2 copper <b>(TAJ 30 pcs)</b>	M-281	50
Viega ProPress cap 1/2 in copper (50 in OS in C-061)	M-281	28
Viega ProPress adapter 1/2 x 1/2 MPT bronze <b>LEADED</b>	M-281	0
Viega ProPress coupling stop 1/2 x 1/2 copper <b>(TAJ 50 pcs)</b>	M-281	44
Viega ProPress coupling no stop 1/2 x 1/2 copper	M-281	70
Viega PEXPress adapter 1/2 x 3/4 FNPT bronze	M-281	30
Viega PexPress elbow 3/4 90° polymer	M-281	30
Viega PEXPress tee 3/4 polymer NL	M-281	41
Viega PEXPress ProPress adapter 3/4 x 3/4 bronze <b>LEADED (164 NO LEAD c-075 #99640)</b>	M-281	17
Viega ProPress cap 3/4 in copper (50 in OS in C-061)	M-281	28
Viega ProPress adapter bronze P x FNPT model 2912 3/4 in x 1/2 in NPT	M-281	40
Viega PEXPress coupling 3/4 x 3/4 bronze F x F press end <b>(TAJ 100 pcs)</b>	M-282	196
Viega PEXPress elbow 3/4 90° 3/4 x 3/4 bronze (os C-073)	M-282	219
Viega PEXPress ProPress adapter 3/4 x 3/4 bronze <b>NO LEAD(OS in C-075) (TAJ 100 pcs)</b>	C-075	130
Viega ProPress elbow 3/4 in 90° copper OS in E-016 <b>(to be replaced by 77022 (TAJ 200 pcs 2 bxs 77022))</b>	M-282	31
Viega ProPress tee 3/4 x 3/4 x 3/4 copper OS in C-056 <b>(TAJ 100 pcs)</b>	M-282	117
Viega ProPress tee 3/4 x 3/4 x 1/2 copper OS in C-056 <b>(TAJ 50 pcs)</b>	M-282	57
Viega ProPress elbow 3/4 in 45° P X P copper <b>(to be replaced by 77023 in C-052 (TAJ 50 pcs))</b>	M-282	18

ITEM	LOCATION	INVENTORY QTY.
Viega ProPress adapter 3/4 x 1/2 MPT bronze <b>LEADED</b>	M-282	8
Viega ProPress coupling stop 3/4 x 3/4 copper OS in C-076	M-282	18
Viega ProPress reducer 3/4 x 1/2 copper street press connection <b>OS in C-062</b>	M-282	112
Viega ProPress coupling no stop 3/4 x 3/4 copper OS in C-063	M-282	39
Viega ProPress adapter 3/4 x 3/4 MPT bronze OS in C-065 <b>(TAJ 100 pc)</b>	M-282	122
Viega ProPress adapter 3/4 x 1 bronze P x MNPT OS in C-061 <b>(TAJ 100 pc)</b>	M-283	102
Viega ProPress adapter 3/4 x 3/4 bronze P x FNPT OS in D-016 <b>(TAJ 50 pcs)</b>	M-283	79
Viega ProPress elbow 3/4 in 90° bronze OS in C-072 <b>(TAJ 100 pcs)</b>	M-283	104
Viega PEXPress tee 3/4 x 3/4 x 3/4 bronze <b>(OS in C-075)</b>	M-283	117
Viega ProPress elbow 1 in 90° copper <b>(to be replaced by 77027 in C-052 (TAJ 100 pcs 2 bxs))</b>	M-283	24
Viega ProPress tee 1 inch copper OS in C-061 <b>(TAJ 50 pcs)</b>	M-283	6
Viega ProPress elbow 1 in 45° copper <b>(to be replaced by 77028 C-052 (TAJ 100 pcs))</b>	M-283	14
Viega ProPress cap 1 in copper <b>(TAJ 50 pcs)</b>	M-283	82
Viega ProPress adapter 1 x 1 FPT bronze <b>LEADED (replaced by 79330 NL in C-071) (TAJ 10 pcs)</b>	M-283	12
Viega ProPress coupling stop 1 x 1 copper OS in C-062 <b>(TAJ 50 pcs)</b>	M-283	58
Viega ProPress reducer 1 x 3/4 copper OS in C-051 <b>(TAJ 50 pcs)</b>	M-283	75
Viega ProPress coupling no stop 1 x 1 copper <b>(TAJ 100 pcs)</b>	M-283	112
Viega ProPress adapter 1 x 3/4 bronze P x MNPT OS in C-065 <b>(TAJ 100 pc)</b>	M-283	115
Viega ProPress adapter 1 x 1 MPT bronze OS in C-065 <b>(TAJ 100 pc)</b>	M-283	139
Viega ProPress adapter bronze P x MNPT model 2911 1 in x 1 1/4 in NPT	M-284	
Viega ProPress adapter 1 x 3/4 bronze P x FNPT OS in C-071 <b>(TAJ 50 pcs)</b>	M-283	72
Viega ProPress elbow 1 in 90° bronze P x F OS in C-071 <b>(TAJ 60 pcs)</b>	M-284	65
Viega ProPress elbow 90° copper close ruff P x P model 2916 1 1/4 inch	M-284	10
Viega ProPress elbow 45 copper P x P model 2926 1 1/4 inch	M-284	10
Viega ProPress reducer copper P x P model 2915.2 1 1/4 in x 1 in	M-284	10
Viega ProPress coupling copper no stop P x P model 2915.3 1 1/4 inch	M-284	10
Viega ProPress adapter bronze P x MNPT model 2911 1 1/4 in x 1 in NPT	M-284	10
Viega ProPress adapter bronze P x MNPT model 2911 1 1/4 in x 1 1/4 in	M-284	10
Viega ProPress adapter 1 1/4 x 1 1/2 MPT bronze OS in C-065 <b>(TAJ 50 pc)</b>	M-284	63
Viega ProPress adapter bronze P x FNPT model 2912 1 1/4 in x 1 in NPT	M-284	10
Viega ProPress adapter bronze P x FNPT model 2912 1 1/4 in x 1 1/4 in NPT	M-284	10
Viega ProPress adapter 1 1/4 x 1 1/2 P x FNPT bronze OS in C-066 <b>(TAJ 20 pcs)</b>	M-284	32
Viega ProPress reducer copper P X P model 2915.2 1 1/2 in x 1 in (OS in D-036)	M-284	15
Viega ProPress reducer copper P X P model 2915.2 1 1/2 in x 3/4 in (OS in D-036)	M-284	15
Viega ProPress elbow 45 copper P x P model 2926 1 1/2 inch (OS in D-032 )	M-285	20
Viega ProPress adapter 1 1/4 x 1 1/2 In Bronze C & MNPT	M-285	1
Viega ProPress elbow 1 1/2 in 90° copper P x P OS in C-053 <b>(to be replaced by 77037 in C-053 (TAJ 30 pcs))</b>	M-285	2
Viega ProPress tee copper P x P model 2918 1 1/2 in (OS in D-036)	M-285	10
Viega ProPress cap 1 1/2 in copper (os IN C-061) <b>(TAJ 50 pcs-2 bx)</b>	M-285	53
Viega ProPress adapter 1 1/2 x 1 1/2 MPT bronze <b>LEADED (nl 79275 C-066) (Taj 30 pcs 79275)</b>	M-285	46
Viega ProPress adapter 1 1/2 x 1 1/2 C x FNPT bronze <b>LEADED (to be replaced by NL 79365 C-071)</b>	M-285	20
Viega ProPress coupling stop 1 1/2 x 1 1/2 copper OS in C-062 <b>(TAJ 30 pcs)</b>	M-285	39
Viega ProPress reducer 1 1/2 x 1 1/4 copper C x C	M-285	2
Viega ProPress coupling no stop 1 1/2 copper C x C OS in C-076 <b>(TAJ 30 pcs)</b>	M-285	34
Viega ProPress adapter bronze P x MNPT model 2911 1 1/2 in x 1 1/4 in	M-285	10
Viega ProPress adapter 1 1/2 x 2 MPT bronze OS in C-066 <b>(TAJ 30 pcs)</b>	M-285	32
Viega ProPress adapter 1 1/2 x 1 1/4 bronze P x FNPT OS in C-065 <b>(TAJ 20 pcs)</b>	M-285	22



ITEM	LOCATION	INVENTORY QTY.
Viega ProPress elbow 1 1/2 in 90° bronze FPT <b>OS in C-072 (TAJ 30 pcs)</b>	M-285	37
Viega ProPress elbow 1 1/2 in 90° bronze P x FPT <b>NL (square back)</b>	M-285	6
Viega ProPress reducer copper P X P model 2915.2 2 in x 1 in	M-286	9
Viega ProPress reducer copper P X P model 2915.2 2 in x 3/4 in (OS in D-031)	M-286	20
Viega ProPress elbow 45 copper P x P model 2926 2 inch (OS in D-036)	M-286	15
Viega ProPress elbow 2 in 90° copper OS in C-055 <b>(to be replaced by 77042 (TAJ 24 pcs))</b>	M-286	2
Viega ProPress tee copper P x P model 2918 2 inch (OS in D-031)	M-286	10
Viega ProPress cap 2 in copper (os IN C-077) <b>(TAJ 50 pcs- 2 bx)</b>	M-286	52
Viega ProPress adapter 2 x 2 MPT bronze LEADED OS in C-067(no lead 79290) <b>(TAJ 30 pcs)</b>	M-286	32
Viega ProPress adapter 2 x 2 FPT bronze <b>LEADED (79370 NL OS in C-072)(TAJ 20 pcs )</b>	M-286	30
Viega ProPress coupling stop 2 x 2 copper OS in C-062 <b>(TAJ 20 pcs)</b>	M-286	30
Viega ProPress reducer copper P x P model 2915.2 2 in x 1 1/2 in	M-286	
Viega ProPress coupling no stop 2 in copper P x P OS in C-063 <b>(TAJ 22 pcs)</b>	M-286	25
E-coder R900 <b>(INSIDE)</b>	M-floor	0
hydraulic cement 50 lb pail	M-floor	
RADIO READS pit WITH 6 FOOT WIRE	M-top	0
RADIO READS pit WITH 25 FOOT WIRE	M-top	0
<b>ENGINEERING 3M Marker balls - CITY PO</b>	M-top	330
<b>ENGINEERING Near Surf marker - CITY PO</b>	M-top	47
cord tenders	M-top	7
RIDGID NO 20 TUBE CUTTER	OFFICE	1
10 foot PVC schedule 40 1/2 in conduit	RACK	15
10 foot PVC schedule 40 1 1/4 in conduit	RACK	11
10 foot PVC schedule 40 1 1/2 in conduit	RACK	14
<b>ADAPTER PEX X MNPT 3/4" BRONZE LEADED (OS unleaded E-016)</b>	M-280	125
female pex NO LEAD	M-280	80
Adapter, 1 1/4 x 1 1/2 In, Bronze 77862	M-281	2
Coupling, C x C, 3 In, with stop Copper os in D-023	M-281	8
Coupling, With Stop, 4 In, Copper <b>os E-016</b>	M-281	2
Elbow, 45 Deg, C x C, 3 In, Copper 20658	M-281	2
Tee, 3 x 3 2 In, Copper <b>os in D-007</b>	M-281	1
2 1/2 inch copper coupling XL-C press fitting <b>OS in D-028</b>	M-281	2
Elbow, 90 Deg, C x C, 3 In, Copper <b>os in D-001</b>	M-281	2
Adapter, 1 x 1 In, Bronze <b>(REPLACED BY 79245)</b>	M-283	3
Adapter, 1 x 1 In, Bronze <b>(REPLACES 77842 overstock in D-034)</b>	M-283	39
Adapter, 1 x 1 In 77917	M-283	7
Coupling, C x C, 1 In, Copper	M-283	15
Elbow, 45 Deg, C x C, 3/4 In, Copper 77612	M-283	32
Tee, 3/4 x 3/4 x 1/2 In, Copper <b>os in E-016</b>	M-283	9
Tee, 3/4 x 3/4 x 3/4 In, Copper <b>(no lead O/S 49540 M209)</b>	M-283	26
3/4" x 3/4" C x M NPT brozen adapter shiny black EPDM seal <b>(replaced by 69640)</b>	M-283	0
3/4" x 3/4" PEX Press x C bronze PEX press ProPress adapter <b>replaces 77832 to be replaced by 79230 in D-031</b>	M-283	8
3/4" x 3/4" P x M NPT brozen male adapter <b>NO LEAD</b> os d-031	M-283	18
3/4" X 3/4" Pex Press x C bronze PEX press ProPress adapter <b>NO LEAD</b> replaces 77832, 69640, 79230 <b>OS in D-035</b>	M-283	
Adapter, 3/4 x 3/4 In, Bronze female <b>replaced by 79315 OS in D-032, D-033</b>	M-283	6
Adapter, 3/4 x 3/4 In, Bronze female <b>replaces 77907 OS in D-032, D-033</b>	M-283	40
Coupling, C x C, less stop 3/4 In, Copper <b>os D-003</b>	M-283	9

ITEM	LOCATION	INVENTORY QTY.
Coupling, With Stop, 3/4 In, Copper <b>os in D-003</b>	M-283	24
Elbow, 90 Deg, C x C, 3/4 In, Copper (OS E-016)	M-283	14
2 1/2 inch threaded flange (4TXF7)	M-283	0
2 1/2 inch x 2 inch HEX bushing (2WJ96)	M-283	0
1 x 3/4 NPT bronze adapt x MNPT <b>OS in D-029</b>	M-283	22
Adapter, 3/4 x 1/2 In, Bronze 77827	M-284	8
adapter 1 1/2 x 1 1/2 bronze 77947 <b>overstock in M-286</b>	M-284	21
Adapter, 1 1/2 x 1 1/2 In, Bronze 77872 <b>overstock in M-286 no lead o/s 91525 M209</b>	M-284	15
Coupling, With Stop, 1 1/2 In, Copper <b>os in D-008</b>	M-284	8
<b>do not use</b>	M-284	-5
Adapter, 2 x 2 In, Bronze 77952 <b>overstock in M-286</b>	M-284	11
2" x 2" CxM NPT brozen adapter C x M NPT shiny black EPDM seal <b>OS D-037 (replaced by 79290 no lead D-036)</b>	M-284	5
Coupling, With Stop, 2 In, Copper os in M-286 & D-007	M-284	9
2 copper elbow 90 PxP cls ruf os D-021	M-284	24
1 1/2 copper elbow 90 PxP cls ruf <b>os D-022</b>	M-285	23
1 1/2 x 1 1/4 adapter FNPT <b>os D-013</b>	M-285	12
1 1/2 x 2 adapter MNPT os D-020	M-285	12
1 1/4 x 1 1/2 adapter FNPT os D-019	M-285	12
1 copper elbow 45 PxP os D-008	M-285	24
1 copper elbow 90 PxP cls ruf os D-011	M-285	45
1 copper tee PxPxP os D-018	M-285	48
1 cplg PxP with stop os D-018	M-285	24
1 x 1 elbow 90 PxP os D-012	M-285	24
1 x 3/4 adapter FNPT os D-019	M-285	4
1 x 3/4 reducer PxP os D-024	M-285	24
1/2 cplg PxP with stop os D-023	M-285	46
2 cplg PxP no stop os D-017	M-285	12
2 x 1 1/2 adapter MNPT os D-020	M-285	12
2 x 2 elbow 90 PxP os D-012	M-285	6
3 cplg PxP no stop copper os D-002	M-285	6
3 x 3 adapter PxMNPT copper os D-017	M-285	6
3/4 cplg PEX bronze	M-285	144
3/4 tee PEX bronze	M-285	46
3/4 x 1 adapter x MNPT os D-019	M-285	3
3/4 x 3/4 elbow 90 PxP os D-020	M-285	24
1 1/4 x 1 1/2 P X M NPT adapter os D-013	M-285	12
Viega ProPress 45° elbow zero lead 2 inch	M-286	4
1/2 in 90° sch 40 elbows (overstock of M-282)	M-286	0
1 1/2 cplg PxP no stop <b>os D-028</b>	M-286	
1 1/2 x 1 1/2 elbow 90 PxP	M-286	
1 1/2 x 1 1/2 elbow 90 PxP	M-286	
3 x 2 XL-C reducer PxP copper	M-286	
3 x 3 adapter PxFNPT copper	M-286	
4 x 3 XL-C reducer PxP copper	M-286	
4 x 4 adapter PxFNPT copper os D-024	M-286	
4 x 4 adapter PxMNPT copper os D-023	M-286	
Coupling, With Stop, 2 In, Copper <b>OS of m-284 &amp; OS D-007</b>	M-286	
installation pit kits	MT-000	
10 foot PVC schedule 40 3 in conduit (10 pc in basement)	RACK	10
black buckets	M-top	1
3/4" aquapex poly PEX <b>blue pipe</b>	RACK	10

ITEM	LOCATION	INVENTORY QTY.
3/4" aquapex poly PEX <b>red pipe</b>	RACK	11
copper pipe type L 10 ft lengths 1 in	RACK	6
copper pipe type L 10 ft lengths 3/4 in	RACK	6
copper pipe type L 10 ft lengths 2 in	RACK	1
all thread 5/8 in	RACK	9
all thread 3/4 in	RACK	12
black gasket material (roll in feet)	RACK	84
K81 hydrant lower stem for 4 ft hydrant	RACK	3
K81 hydrant lower stem for 4 1/2 ft hydrant	RACK	3
K81 hydrant lower stem for 5 ft hydrant	RACK	2
K81 hydrant lower stem for 5 1/2 ft hydrant	RACK	3
K81 hydrant lower stem for 6 ft hydrant	RACK	3
K81 hydrant lower stem for 6 1/2 ft hydrant	RACK	3
K81 hydrant lower stem for 7 ft hydrant	RACK	3
boxes for Mike Wolasz	shelf	0
2 inch type K copper ( roll - 60 in feet)	SR base	60
annealed 3/4 inch copper type L( in feet)	SR base	155
annealed 3/4 inch copper <b>type K</b> ( in feet)	SR base	100
traffic cones - <b>new</b>	SR base	57
<b>used traffic cones</b>	SR base	7
copper 1 in type K (feet)	SR base	100
copper 1 1/2 in type K (feet)	SR base	58
coil of <b>1 in CTS black PEX</b> pipe 100 foot roll	SR base	220
"UTILITY WORK AHEAD" sign	SR base	3
stands for UTILITY signs	SR base	3
Igloo beverage cooler 5 gal	SR base	5
Igloo beverage cooler 3 gal	SR base	5
Igloo beverage cooler wire holder for 3 gal	SR base	4
2 inch discharge/suction hose	SR base	200
3 inch suction hose	SR base	85
street ladder fiberglass 10 foot	SR base	3
street ladder fiberglass 12 foot	SR base	1
Hanes manhole ladder 10 foot	SR base	3
Hanes manhole ladder 12 foot	SR base	3
35 lb pail lithium grease	SR floor	3
grass seed 20 lb bags Scotts	SR floor	17
<b>MUELLER TRAFFIC REPAIR KITS</b>	front office floor	15
<b>City bought hydrant flags</b> (5 per bundle)	SR base	3549
COUPLING, 2 X 1/8 BEND FCT X C	SR-B-024/B-30	36
4 FT HYDRANT	YARD	7
4 1/2 FT HYDRANT (red)	YARD	4
5 FT HYDRANT (blue)	YARD	16
5 1/2 FT HYDRANT (white)	YARD	23
6 FT HYDRANT (yellow)	YARD	20
6 1/2 FT HYDRANT (orange)	YARD	9
7 FT HYDRANT (nc)	YARD	8
4 FT HYDRANT	YARD	13
4 1/2 FT HYDRANT (red)	YARD	9
5 FT HYDRANT (blue)	YARD	31
<b>accessories for 36 in Smith Blair coupling located in Hydrant Room basement</b>	B	2
5 1/2 FT HYDRANT (white)	YARD	28

ITEM	LOCATION	INVENTORY QTY.
<i>extra gaskets for #411 36 inch Smith Blair coupling located in Hydrant Room basement</i>	B	6
<del>6 FT HYDRANT (yellow)</del>	<del>YARD</del>	17
Reed re-rounder/strightener for copper tubing service area cage		1
<del>6 1/2 FT HYDRANT (orange)</del>	<del>YARD</del>	7
universal coupler hose end 1 inch	E	0
<del>7 FT HYDRANT (nc) (only in the yard)</del>	<del>YARD</del>	7



## Attachment 3: Resumes for Key Staff

### **Peter Vetter:**

- Veolia O&M Project Manager for the New London, CT, water and wastewater operations contract
- Candidate Project Manager for the Harrisburg Operations

### **Tim Shea, P.E.:**

- Veolia regional Vice President of Operations for Pennsylvania
- Candidate Project Director for the Harrisburg Contract



## Peter Vetter

### District Manager



36 years  
total experience

11 years  
with Veolia

Mr. Vetter is the District Manager with Veolia Water North America – Northeast, LLC with responsibility for managing the ongoing operations, maintenance and management (O&M) agreement with the City of New London, Connecticut. This is a comprehensive operation has been expanded a number of times and now covers the operation and management of the City's water treatment and supply, and the wastewater collection and treatment systems.

Mr. Vetter has over 36 years of water and wastewater industry plant operations and environmental engineering experience. This experience ranges from operating large-scale wastewater plants with the City of New York at the start of his career, to the operation of smaller regional systems in New England. Mr. Vetter's experience includes managing diverse staff groups of union and non-union personnel, and effectively managing the transition of operations responsibility from facility owners as well as from other operators. Through his strong base of experience, he understands the unique needs and challenges of managing broad-scope O&M projects.

## Related Project Experience:



### Project/District Manager - OM&M Contract – New London, CT (2008-Present)

- Worked in progressively responsible role for the management of the comprehensive operations and maintenance contract, with responsibility for 39 union and non-union staff. Serves as the Operator-in-Charge for the City's water system (9-MGD water treatment plant and 240-mile distribution system that serves more than 13,000 accounts) and the wastewater system (10-MGD advanced wastewater treatment facility, 80-mile collection system and seven pumping stations).
- At New London, Veolia is responsible for meter reading, billing (for 14,100 customers), collections, new service processing, shutoffs, customer inquiries and record maintenance.
- Other key elements of the New London operation is full responsibility for capital program planning and implementation, and asset management, including an integrated above-ground (AGAM) and underground asset management (UGAM) program.



### Sewer Superintendent- West Warwick Regional Wastewater Facility - Town of West Warwick, Rhode Island (2006-2007)

- Managed all activities associated with the day-to-day O&M for a 10-MGD advanced wastewater treatment facility. Responsible for the management and operations of other elements of the Town's wastewater system, including: 85 miles of collection line, seven pumping stations, and a static pile composing facility.



### Multiple Project Transitions and O&M Support Projects – Northeast Region

- Engaged in supporting new project transitions and other ongoing operations projects in the State of Connecticut and other parts of the Northeast region.
- Veolia's New London customer service operation also supports other satellite operations, including that for the Town of Seymour, Connecticut. The scope of that contract encompasses: service turn on/off; billing/collections complaints; handling all money; handling delinquent accounts up to 120 days, referring old accounts to the City's attorney; and normal operations issues for the 400 users billed on a semi-annual basis.

## Education/Training:

Veolia Business, Management, Safety and Operations Training Programs  
BS, Civil & Environmental Engineering, University of Rhode Island  
MS (in progress), Environmental Engineering program, Stevens Institute of Technology, NJ

## Licenses:

Class IV, WW Operator, CT, 2008  
Class IV, Water Treatment Operator, CT, 2008  
Class III, Water Distribution Operator, CT, 2008  
Grade 6 (combined) Industrial & Municipal WW Operator, Massachusetts, 1999  
Grade 4, WW Operator, Rhode Island, 2004



---

## Experience/Work History:

- **2008-Present: District Manager and Project Manager - Veolia Water North America – Northeast, LLC – New London, Connecticut**
  - Ongoing management of water and wastewater O&M at New London, and oversight and support of satellite operations that are supported from this site; including billing support for North Haven and Seymour, Connecticut.
- **2/2007-2008: Senior Project Manager - West Greenwich, Rhode Island - Amgen Inc.**
  - Served as Design Engineer and Project Manager for a new 250,000 gallon/day wastewater pretreatment system.
- **3/2006-2/2007: Sewer Superintendent - West Warwick Regional Wastewater Facility - Town of West Warwick, Rhode Island**
  - Managed day-to-day O&M for a 10-MGD advanced wastewater treatment facility, and other elements of the Town's wastewater system, including 85 miles of collection line, seven pumping stations, and a static pile composting facility.
- **2002-2006: Business Development Manager - Warwick, Rhode Island - America Water Services**
  - Worked in the New England region, with responsibility for developing competitive design, build and operate projects, and acquisitions bids for municipal and private water and wastewater utilities.
- **2000-2002: Project Manager - Worcester, Massachusetts - Tighe & Bond Consulting Engineers**
  - Served as the Design and Project Manager for industrial and municipal wastewater treatment facilities. Performed Health and Safety Assessments, prepared and implemented facility specific programs including: confined space, accident investigation, lock-out/tag-out, and construction safety management. Performed environmental assessments, and developed facility specific environmental management systems including; NPDES, hazardous waste, storm water, pollution prevention and community right to know (SARA).
- **1992-2000: Director of Environmental, Health, & Safety (EH&S) - Walpole, Massachusetts - BBA NONWOVENS (formerly the Veratec Division of International Paper)**
- **1987-1992: Site Manager - Linden, New Jersey - GAF Chemicals Corporation**
  - Managed all environmental activities associated with the operation of a 125-acre batch chemical manufacturing facility until the facility was shutdown in 1990. This included hazardous materials and waste management, air permitting, storm water management and wastewater treatment. Provided internal wastewater consulting resources to the corporation in support of five other manufacturing sites located throughout the United States and Canada.
  - Served as the Utilities Manager, with responsibility for maintaining, operating and managing projects for all utilities associated with a large chemical manufacturing facility. Equipment included: boilers, turbines, compressors, process/potable water and wastewater distribution and treatment (2-MGD). Served as the corporate wastewater project manager and troubleshooter, responsible for NPDES and Pretreatment compliance at five specialty chemical manufacturing facilities throughout North America.
  - Managed a staff of 22 union utility and wastewater operators. Directed the shutdown and decommissioning of the chemical manufacturing facility. Coordinated all post-production activities including site assessment, remediation plan design and implementation, and conversion of the existing WWTF into a ground water remediation system.
  - Designed and operated fully automated and remotely monitored ground water remediation equipment at a variety of U.S. Environmental Protection Agency Superfund Sites.
- **1983-1987: Senior Process Control Engineer - New York City Department of Environmental Protection - New York**
  - Served as a Senior Process Control Engineer with this municipal agency responsible for the design, construction and operation of 14 large wastewater treatment facilities. Managed, monitored and controlled all treatment processes for a variety of large municipal wastewater treatment facilities (WWTF).
  - Served as the Project and Startup Engineer for the New York City's most technologically advanced WWTF (North River - 125-MGD). Additionally, served as the Operations Manager for two large municipal WWTFs (Bowery Bay - 150-MGD, North River - 125-MGD).

## Other Professional Activities:

- Guest Lecturer: University of Rhode Island – Civil Engineering, Construction Safety Management
-



## Education:

BS, Civil Engineering,  
Rutgers University

## Registrations/ Certifications:

Grade T-2,  
Water Treatment Plant  
Operator,  
New Jersey

Registered Professional  
Engineer,  
New Jersey

Certified Municipal  
Engineer,  
New Jersey

## Memberships/ Affiliations:

American Water Works  
Association

Water Environment  
Federation

Pennsylvania Water  
Environment  
Association (PWEA)

New Jersey Water  
Environment  
Association (NJWEA)

Co-chair NJWEA Asset  
Management/CIS  
Committee

New Jersey Association  
of Environmental  
Authorities

Ocean County  
Municipal Utilities  
Authority Association

New Jersey Water  
Conference, North &  
South sections

## Background:

Mr. Shea is a Vice President of Operations and Area Manager with Veolia Water North America Operating Services, LLC (Veolia), and works as part of the Mid-Atlantic management and support team. In this role, he provides oversight and management of operations and projects in the states of Pennsylvania, and New York, and other parts of the region.

Mr. Shea works as part of Veolia's Municipal and Commercial operations group in the region, and is responsible for the management and support of operations and other projects in the Mid-Atlantic Region. This includes the water, wastewater and related operations, maintenance and management (O&M) contracts of Veolia Water, and the owned and operated energy facilities of Veolia Energy. He has worked with Veolia since 2015, and he has over 25 years of water and wastewater industry experience. Prior to his current role, Mr. Shea served as the regional manager for an environmental consulting firm. He previously worked for municipal and regulated private water utilities in management, operational and engineering positions.

## Key Experience:

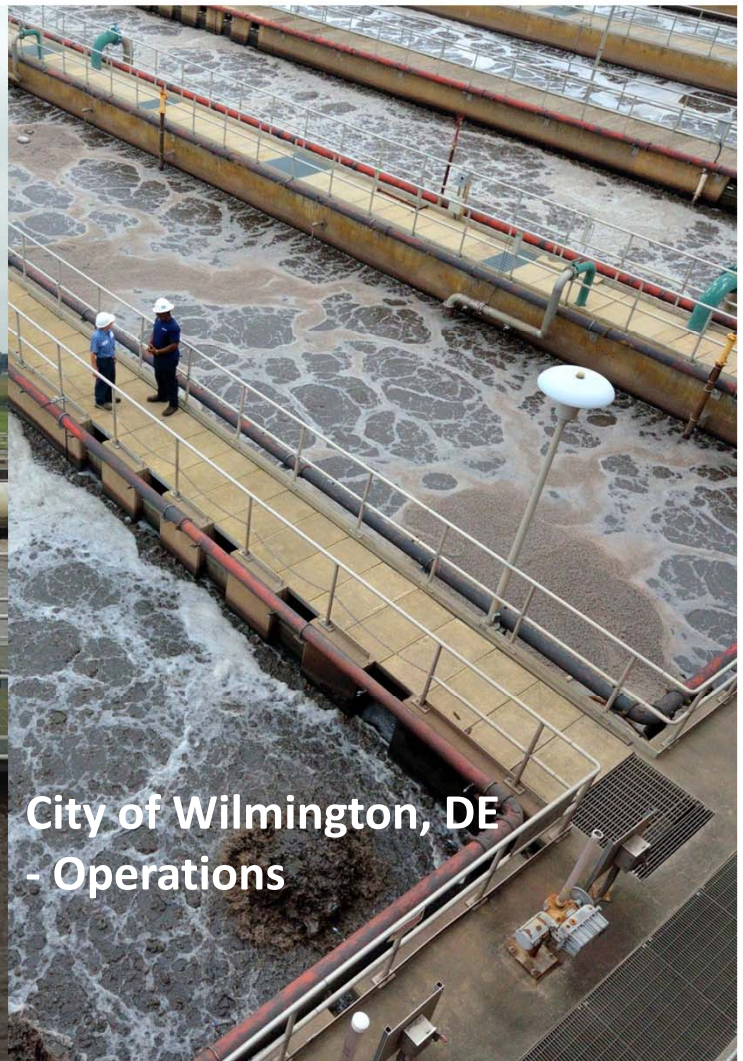
- **2015-Present: Vice President – Municipal and Commercial Operations Group – Veolia Water North America Operating Services, LLC – Trenton, New Jersey**
  - Work as part of the Veolia operations and management team for the Mid-Atlantic region of the U.S. In that role, provides oversight and management for water, wastewater, energy facility and other operations and projects in New Jersey and other parts of the region.
  - Responsible for managing and supporting ongoing long-term water and O&M and related projects in the region, including:
    - Elizabeth Township, Pennsylvania – Ongoing O&M for the community's 1.4-MGD Activated Sludge wastewater treatment plant and biosolids disposal operations.
    - Township of Long Hill, New Jersey – Transition and ongoing O&M of wastewater system, including: 0.9 MGD oxidation ditch wastewater treatment plant; sludge/solids processing and disposal to the Township's existing or approved disposal sites; eight sanitary pump stations; 286,290 linear feet of sanitary sewers; 1,260 sanitary manholes; and 15,200 linear feet of force mains.
    - Washington Borough, New Jersey – O&M for a 1.5-MGD wastewater treatment plant, seven lift stations, 39 miles of sewer lines, and Industrial Pretreatment Program management.
    - City of East Orange, East Orange Board of Water Commissioners (EOBWC), New Jersey – Managed the now completed interim O&M contract for the City's water supply, water treatment and wastewater systems.
    - O&M Contracts in New York State - Projects and operations in New York, including those with: the City of Poughkeepsie, New York (10-MGD wastewater treatment plant and nine pump stations, as well as management of the Industrial Pretreatment and biosolids disposal programs) Rockland County, New York (1.5-MGD water

reclamation plant); and two industrial sites at Somers, New York, treating domestic and industrial wastewater.

- Manages the owned and operated facilities of Veolia Energy in the region. This includes projects in the State of New Jersey for: ownership and operation of a district energy network that provides centrally-produced hot water and chilled water to customers in the central business district of the City of Trenton; full-service facility operations and management under a building operations services contract for the NFL Films Studio in Mount Laurel; and operating the combined heating, cooling and power plant at Ocean County College, Toms River.
  - **2010-2015: Regional Manager, Water Resources – T&M Associates – Middletown, New Jersey**
    - Led all water resource projects and pursue key business opportunities throughout the geographic reach of the company's water resources group which included 42 professionals. Developed water resources annual business plan based on corporate growth. Provided market intelligence such as regulatory drivers and client spending trends across many business units while participating in corporate wide 5-year strategic plan development. Identified, pursued and captured new business opportunities, spurring growth in revenue and increasing client base. Led the marketing and cross sale of in vogue services such as renewable energy projects, contract O&M, and GIS/Asset Management programs.
  - **2007-2010: O'Brien & Gere – Regional Client Service Manager – Edison, New Jersey**
    - Governed sales performance and business relationships in New Jersey and Pennsylvania. Devised and executed strategies to drive new business development, producing growth in revenue, client roster, and strengthening company market presence. Engaged clients to understand needs and aligned with company's service roadmap, leading to the sale of water resources, sustainability, and environmental services to public, private and industrial sector clients. Provided local Project Management services for select clients.
    - Served as the Project Manager for a 4.4-MGD iron removal water treatment plant in Jackson, NJ and Project Manager for the community-wide non-potable irrigation system and supply for the Monroe Township MUA, the first such study of its kind in NJ.
  - **1998-2007: Executive Director and Director of Engineer – Jackson Township Municipal Utilities Authority – Jackson, New Jersey**
    - Supervised, guided, evaluated, directed and disciplined 45 Authority personnel in conformance with Authority policies, Collective Bargaining Agreement, Civil Service requirements, and other prevailing laws and regulations. The facilities include 12,000 residential and commercial connections, 100+ miles of sanitary sewer mains, 20+ pumping stations, 150+ miles of water distribution piping, 4 groundwater water treatment plants, 11 water supply wells and 8 water storage facilities and a 450,000 gallons per day wastewater treatment plant.
    - Managed \$3.5 million annual capital budget. Selected, managed and provided oversight of all engineering consultants contracted with the Authority for development review, inspection, capital improvement projects and general engineering assistance. Managed and performed in-house engineering using a staff of three. Provided oversight on new water treatment facility including design changes which resulted in savings of over \$1 million.
  - **1992-1998: Director of Engineering – Shorelands Water Company – Hazlet, New Jersey**
    - Responsible for O&M and improvements for a 17 square mile public water supply system serving 12,000 customers. The company has over 100 miles of water distribution piping, 4 water storage facilities, 10 potable water wells, two water treatment plants, including one of the few membrane plants in New Jersey, and four interconnections with neighboring townships.
  - **1990-1992: Project Manager – Henderson, Breen and Hess – Lacey Township, New Jersey**
  - **1987-1990: Design Engineer/Field Engineer – Schoor DePalma – Brick Township, New Jersey**
-



**City of Boonville, IN  
- Operations**



## **Attachment 4: Combined Sewer Overflow Management Plans**

**City of Wilmington, Delaware:**

- Combined Sewer Overflow Program (2014) Annual Report

**City of Boonville, Indiana:**

- Combined Sewer Overflow Program Long Term Control Plan (2006)

JEFFREY STARKEY  
COMMISSIONER

# City of Wilmington Delaware

LOUIS L. REDDING CITY/COUNTY BUILDING  
800 FRENCH STREET-6<sup>TH</sup> FLOOR  
WILMINGTON, DELAWARE  
19801-3537



## DEPARTMENT OF PUBLIC WORKS *Water Division*

February 11, 2016

Mr. Anthony E. Hummel, P.E.  
DNREC -Division of Water Resources  
Surface Water Discharges Section  
89 Kings Highway  
Dover, Delaware 19901

**RE: Combined Sewer Overflow Program 2014 Annual Report  
City of Wilmington, Delaware - Department of Public Works**

Enclosed please find the Combined Sewer Overflow (CSO) Program Annual Report for the City of Wilmington. This report addresses the Final Long Term Control Plan (FLTCP), Nine Minimum Controls (NMC) and related activities during the calendar year 2014.

If you have any questions, I can be reached in my office at (302) 576-3075.

Sincerely,

A handwritten signature in black ink that reads "Bryan Lennon".

Bryan Lennon  
Assistant Water Division Director

cc: Sean Duffy, Water Division Director-Department of Public Works (via E-Mail)  
Alison Quimby, Environmental Program Manager (via E-mail)

**Bryan Lennon, Assistant Water Division Director**  
DIRECT DIAL: 302-576-3075 FAX: 302-571-4579  
EMAIL: [bp Lennon@WilmingtonDE.gov](mailto:bp Lennon@WilmingtonDE.gov)

DEPARTMENT OF PUBLIC WORKS  
CITY OF WILMINGTON, DE



Combined Sewer Overflow  
(CSO) Program  
2014 Annual Report

Final Long Term Control Plan and  
Nine Minimum Controls

Submitted to:

Delaware DNREC  
Division of Water Resources  
89 Kings Highway  
Dover, DE 19903

December 30, 2015





# CSO Program Annual Report | 2014

## TABLE OF CONTENTS

Tables.....	ii
Figures .....	iii
Executive Summary .....	4
Activities Planned For Next Year.....	7
1. Current CSO Status .....	8
1.1. Sewer System Hydraulic Behavior.....	8
1.2. Storage Performance Summary .....	11
1.3. TREATED FLOW Summary .....	13
1.4. Capture Rate Summary .....	14
2. Final Long Term Control Plan (FLTCP).....	18
2.1. FLTCP Approach Overview .....	18
2.2. FLTCP CSO Objectives.....	18
2.3. CSO Priorities and Projects.....	22
2.3.1. Status and Discussion of Prior Key CSO Projects (K_) .....	22
2.3.2. Status and Discussion of New CSO Projects (N_) .....	25
2.3.3. Status and Discussion of Sewer Separation Feasibility (S_) .....	28
2.3.4. Status and Discussion of Source Controls & Green Infrastructure Projects (G_) .....	32
2.3.5. Status and Discussion of Post Construction Monitoring Plan (P_) .....	37
3. Nine Minimum Controls (NMC) .....	39
3.1. NMC Approach Overview.....	39
3.2. NMC CSO Objectives .....	39
3.3. <b>NMC #1</b> Conduct Proper Operations and Regular maintenance Programs .....	39
Purpose.....	39
Activities .....	39
3.4. <b>NMC #2</b> Maximize Use of the Collection System for Storage .....	44
Purpose.....	44
Activities .....	44
3.5. <b>NMC #3</b> Review and Modify Pretreatment Program .....	45
Purpose.....	45
Activities .....	45
3.6. <b>NMC #4</b> Maximize Flow to the POTW Treatment Plant.....	45
Purpose.....	45
Activities .....	45



# CSO Program Annual Report | 2014

3.7. NMC #5 Prohibit Combined Sewer Overflows During Dry Weather .....	46
Purpose .....	46
Activities .....	46
3.8. NMC #6 Control of Solid and Floatable Materials in CSOs .....	47
Purpose .....	47
Activities .....	47
3.9. NMC #7 Develop and Implement Pollution Prevention Programs .....	47
Purpose .....	47
Activities .....	47
3.10. NMC #8 Notify the Public of CSOs .....	48
Purpose .....	48
Activities .....	48
3.11. NMC #9 Monitor to Effectively Characterize CSO Impacts and the Efficacy of CSO Controls .....	48
Purpose .....	48
Activities .....	49
Appendix A City of Wilmington CSO Sites .....	57
Appendix B Dry Weather Overflows .....	59

## TABLES

Table 1-1 CSO Events and Durations at the Monitored Sites .....	10
Table 1-2 CSO Volumes at the Monitoring Sites .....	10
Table 1-3 Stored Volume Summary .....	12
Table 1-4 Regional WWTP Flow Summary .....	13
Table 1-5 City of Wilmington Pumped Flow Summary .....	14
Table 1-6 Capture Rates for Rainfall Events .....	17
Table 2-1 FLTCP Project Status .....	19
Table 3-1 Summary of CSO Inspections Performed in 2014 .....	41
Table 3-2 Summary of Tide Gate and Other Structures Inspections Performed in 2014 .....	42
Table 3-3 CSO Events, Durations and Volumes at Monitoring Sites .....	43
Table 3-4 Stored Volume Summary .....	44
Table 3-5 Regional WWTP and City of Wilmington Pumped Flow Summary .....	46
Table 3-6 Sampling Locations .....	49
Table 3-7 Parameters Monitored .....	49



# CSO Program Annual Report | 2014

Table 3-8 2014 Water Quality Data .....	51
---	----

## FIGURES

Figure 1-1 CSO Volume vs. Rainfall Depth .....	11
Figure 1-2 Capture Rate Definition .....	16
Figure 1-3 Monthly Capture Rate .....	16
Figure 2-1 South Wilmington Area and Potential Concepts for Sewer Separation .....	31
Figure 2-2 Source water protection area along Brandywine creek in Wilmington .....	33
Figure 3-1 Daily Inspection Log.....	40



# CSO Program Annual Report | 2014

## EXECUTIVE SUMMARY

The City of Wilmington submitted its Final Long Term Control Plan (FLTCP) in September 2010 to DNREC. While DNREC and the EPA have provided comments, the City had not received a notification of acceptance until the issuance of the NPDES permit 2014. However, since 2010, the City has continued to implement the FLTCP as if it was approved upon date submitted because the City felt it was imperative to prepare to implement the key aspects of the FLTCP to improve the water quality of its local streams and to continue making reasonable progress. This document serves as an update outlining the accomplishments, challenges, and future activities from the Final Long Term Control Plan. Please note that the annual report on the Nine Minimum Controls has been incorporated into this submittal. In the past it has been submitted separately.

The FLTCP in 2014 was successful in achieving the following:

The City of Wilmington increased the City's annual capture rate by 7% from 68.6% in 2013 to 75.6%.

The 58 rainfall events produced a sewer system runoff volume of 1,336 MG for the City of Wilmington. Out of this total volume, 492 MG were treated at the Regional WWTP, while the remaining 844 MG overflowed into the Brandywine Creek and the Christina River. The largest overflows were observed at CSO4A (477.7 MG) and CSO30 (106.1 MG). These overflows represent 69% of the annual CSO volume.

During the entire year, 204.6 MG were stored at Canby Park, Prices Run, and Clements Run and Shipley Run. These stored volumes directly contributed to the reduction of CSOs. Considering that the sewer system's storage capacity is 5 MG, the total volume stored corresponds to the full use of the storage facilities 41 times.

The average stored volumes per rainfall event were 41.3%, 107.6% and 103.7% for Canby Park, Prices Run, and Clements and Shipley Run respectively, demonstrating the ability of the RTC system to maximize the use of the storage capacity for CSO abatement in the presence of rainfall events with multiple peak rainfall intensities. In total the stored volumes have contributed to an annual reduction of the CSO volume by 19.5%.

Efforts continued to improve storage at Canby Run via investigating downstream blockages in New Castle County that affect the draindown time of the system.

Efforts continued to improve the pump operating schemes for the 11<sup>th</sup> St. Pump Station. During the entire year of 2014, the 11th Street Pump Station has operated with 4 pumps running simultaneously only during the August 12th and 31st rainfall events. During these 2 events, the maximal pumped flow rate was 132.9 MGD. The 11th Street Pump Station's original configuration, which was designed for a total pumping capacity of 164 MGD with all five of the pumps in operation, or 147 MGD with four pumps, based on the theoretical system curve.

The City has proceeded with the implementation of the Kentmere and Union sewer separation project to be completed by January 2016. Once the project is constructed monitoring equipment will be installed to measure its effectiveness as compared with the stated FLTCP goal of eliminating the CSO in the average year.

The Nine Minimum Controls in 2014 were successful in achieving the following:

NMC 1 – Operations and maintenance - In 2014, total of 12,284 outfall and 2,343 tidal outfall inspections were performed at the CSO locations. In addition, a total of 1,990 lbs of debris was captured and removed from Lancaster and Webb St. (CSO 27) prior to reaching the receiving waters.



## CSO Program Annual Report | 2014

---

**NMC2 – Storage** - The City continues to use the Real Time Control (RTC) system to actively manage flows in the system based on available interceptor capacity and maximize storage at Canby Park, Prices Run, and Clements & Shipley Run. As previously stated, in 2014 there were 843.4 MG of overflow from the City's collection system and the RTC system enabled the 3 storage facilities to store 204.6 MG. Considering the combined storage for all three facilities is 5 MG, they stored 40.9 times their total storage capacity thereby contributing to a 19.5% reduction of CSOs.

**NMC3 – Pretreatment** – The City continues to inspect facilities annually where wet weather control strategies are discussed to determine their effectiveness and benefit. This is documented in the annual inspection reports.

**NMC4 – Maximize flow to POTW** - The City continues to utilize the RTC program to improve wet weather flow management by increasing the conveyance of wet weather flows to the pumping station and the WWTP. The average treated flow rate during CSO periods was 141.6 MGD, of which, 67.2 MGD were from Wilmington. The plant has a capacity of 250 MGD, therefore Wilmington could be pumping an additional 108.1 MGD during CSO periods without exceeding primary treatment plant capacity.

**NMC5 – Eliminate Dry Weather overflows** –In 2014, a total of two dry weather overflows were observed, reported, and corrective actions taken.

**NMC6 – Floatables** - In 2014, 255 tons of debris was removed from the inlets and subsequently kept out the CSS. The City also performs routine street sweeping activities throughout the city and in 2014 kept 750 tons of debris from entering the CSS. Therefore, over 1,000 tons of debris was prevented from entering the CSS and potentially overflowing to waterbodies.

**NMC7 – Pollution Prevention** - education opportunities, including the City's annual Earth Day celebration in April 2014.

In 2014 the City continued co-sponsored the City of Wilmington's Green Jobs Program which engaged the City's youth by providing green-collar work opportunities. Summer interns continue to participate in a 6-week hands-on work experience and classroom environmental education that introduced them to environmental issues and careers.

**NMC8 – Public Notification** - The City continues to inspect and maintain approximately 73 signs installed at 42 CSO locations and/or water access points, notifying the public of CSO wet weather discharges. The City continued to run routine radio spots to inform the public of CSOs, and the conditions under which they occur. During 2014, the CSO informational message played on the WILM (1450am) local radio station 2 times a week and streaming 2 times a week, both during drive times (i.e. morning and afternoon commutes).

**NMC9 – CSO monitoring** - The City continues to collect water quality data monthly at 7 locations in waterbodies where it discharges.

CSO discharge monitoring and modeling continued. Out of the 58 events recorded in 2014, 44 generated a CSO volume in excess of 1 MG. There are six CSO sites where overflow monitoring has been implemented (CSO4A, CSO17, CSO19, CSO25, CSO29 and CSO30). The most active sites in terms of overflow duration were CSO4A and CSO29, with 208.8 hours and 221.5 hours of overflows respectively. No overflows were recorded at CSO17 and CSO19.



## CSO Program Annual Report | 2014

---

The total overflow volume for the City of Wilmington's collection system in 2014 is estimated to be 843.4 MG, of which, 634.3 MG came from the six monitored locations and sites. The remaining sites were simulated by the RTC SWMM model and were estimated to generate 208.9 MG. Based on these estimates, two overflow sites, CSO4A and CSO30, accounted for 69.2% of the total CSO volumes. The largest CSO volumes at the CSO sites that are not monitored occurred at CSO4D (96.3 MG) and CSO24 (62.6 MG). At 19 out of the 33 sites where CSOs are not monitored, the annual CSO volume simulated is less than to 1 MG.





## CSO Program Annual Report | 2014

---

### ACTIVITIES PLANNED FOR NEXT YEAR

Activities in the coming year will focus mainly on efforts to optimize the CSO Real Time Control System performance, to improve the capture rate, to enhance modeling and monitoring efforts, and to implement green infrastructure related activities in the FLTCP. In particular the following specific activities may occur:

- Continue to Address 11<sup>th</sup> Street Pump Station lag pump start levels to achieve higher pumping rates
- Construct the sewer separation project at Kentmere & Union
- Reduce Sensor and equipment failures
- Improve the optimality of the GOP RTC set points
- Improve performance of the Canby tank
- Continue to monitor Rockford Road improvement performance
- Continue development of monitoring plans for high priority outfalls and key system areas



# CSO Program Annual Report | 2014

## 1. CURRENT CSO STATUS

In 2014, there were 58 rainfall events with a total of 227 hours, recorded by the six rain gauges covering the City of Wilmington. The average rainfall depth recorded was 0.68 inches. The wettest month was April, with 42 hours of rain and a total rainfall depth of 6.9 inches. The largest rainfall event was recorded on April 29<sup>th</sup> with 3.48 inches received in 12 hours. This intensity corresponds to a rainfall event with a 5-year return period.

The 58 rainfall events produced a sewer system runoff volume of 1,336 MG for the City of Wilmington. Out of this total volume, 492 MG was treated at the Regional WWTP, while the remaining 844 MG overflowed into the Brandywine Creek and the Christina River. The largest overflows were observed at CSO4A (477.7 MG) and CSO30 (106.1 MG). These overflows represent 69% of the annual CSO volume. See Appendix A City of Wilmington CSO Sites for CSO site locations.

Pumped flow data was available for all but 5 days of 2014. During the 360 days pumped flow data was available, 25,056 MG was conveyed to the Regional WWTP. The treated runoff volume represented 8.1% of the total treated flows. The average treated flow during CSO periods was 141.6 MGD (56.6% of the primary treatment capacity and 35.4% of the tertiary treatment capacity). During the same period, the average pumped flow from the 11<sup>th</sup> Street Pump Station was only 67.2 MGD (41% of the original pumping capacity).

During the entire year, 204.6 MG were stored at Canby Park, Prices Run, and Clements Run and Shipley Run. These stored volumes directly contributed to the reduction of CSOs. Considering that the sewer system's storage capacity is 5 MG, the total volume stored corresponds to the full use of the storage facilities 41 times. The average stored volumes per rainfall event were 41.3%, 107.6% and 103.7% for Canby Park, Prices Run and Clements and Shipley Run respectively, demonstrating the ability of the RTC system to maximize the use of the storage capacity for CSO abatement in the presence of rainfall events with multiple peak rainfall intensities. In total the stored volumes have contributed to an annual reduction of the CSO volume by 19.5%.

For the City of Wilmington, the annual capture rate is estimated at 75.6%. This capture rate is significantly lower than the optimum capture rate that could be achieved if the WWTP and the 11<sup>th</sup> Street Pump Station were used to their original design capacities during periods of CSOs which is estimated at 95.5%.

The difference between the observed and optimum capture rates is explained in large part by the presence of downgraded operating modes during rainfall events. When the RTC system is operated in a downgraded mode, the control objective is no longer to minimize CSO volumes but rather to guarantee the safe operation of the sewer collection system. In 2014, the RTC sites were operated in a downgraded mode 5.8% of the time. However, 88.9% of the overflows recorded at the three main CSO sites (CSO4A, CSO30 and CSO 29 Canby Park) were observed during that period.

For the three main CSO sites, 83% of the overflow volumes were recorded while in operating mode 9, which is activated in the presence of a high-high water level alarm. At Canby Park, high-high water level alarms are caused by debris limiting the conveyance capacity of the Silverbrook Run to approximately 4.5 MGD. At CSO4A and CSO30, high-high water level alarms are caused by the operation of the 11<sup>th</sup> Street Pump Station. In order to decrease the appearance of operating mode 9 at Canby Park, debris will need to be removed so that Silverbrook Run achieves its theoretical free flow capacity of 12 MGD.

### 1.1. SEWER SYSTEM HYDRAULIC BEHAVIOR

The total overflow volume for the City's collection system amounted to 843.4 MG. This represents 63.1% of the total runoff volume estimated. The major CSO sites were CSO4A and CSO30, where 477.7 MG and 106.1 MG overflowed respectively (69.2% of the total CSO volume). The annual capture rate for the City of Wilmington is estimated at 75.6%.



## CSO Program Annual Report | 2014

---

During the 360 days when pumped flow rates were available, 7,571 MG were pumped from the City of Wilmington to the Regional WWTP. During the same period, the Regional WWTP treated 25,056 MG. The runoff volume treated was 2,037 MG. From this treated runoff volume, 61.4% came from the City of Wilmington.

Out of the 58 events recorded in 2014, 44 generated a CSO volume superior to 1 MG. Based on the six CSO sites where overflow detectors have been implemented (CSO4A, CSO17, CSO19, CSO25, CSO29 and CSO30, as seen in Table 1-1), the most active sites in terms of overflow duration were CSO4A and CSO29, with 208.8 hours and 221.5 hours of overflows respectively. No overflows were recorded at CSO17 and CSO19. In this report, an overflow event is defined as a time period characterized by a minimal duration of 10 minutes with an overflow detection followed by a 6-hour period without an overflow.

At CSO17, CSO19 and CSO30, the reported overflow durations and frequencies were based on tilt meters. At CSO4A, the overflow durations and frequencies were estimated using level measurements upstream of the wooden baffle and in the Brandywine Creek. At this location, the vibrating fork cannot be used to estimate overflow frequencies and durations due to tide levels. At CSO25, overflow durations and frequencies were estimated using level measurements in the upstream chamber. At this location, a vibrating fork can be used to report overflow durations and frequencies. However, before the month of October, this vibrating fork did not work properly and no overflows were recorded.

During 2014, CSO volumes totaling 634.3 MG were computed using measurements at the CSO4A, CSO25, CSO29, and CSO30 sites (Table 1-2). These CSO volumes were calculated using frontal and bending weir equations.

At the sites where CSOs are not computed using measurements, the total CSO volume simulated by the RTC SWMM model is 208.9 MG. When adding the total volume computed at the CSO monitoring sites to this SWMM simulated volume, we find a total CSO volume for the City of Wilmington's collection system of 843.4 MG. Based on this result, the two main overflow sites, namely CSO4A and CSO30, accounted for 69.2% of the total CSO volumes. The largest CSO volumes at the CSO sites that are not monitored occurred at CSO4D (96.3 MG) and CSO24 (62.6 MG). At 19 out of the 33 sites where CSOs are not monitored, the annual CSO volume simulated is less than 1 MG.

For the City of Wilmington's collection system, we find a relatively good relationship between the estimated CSO volume and the average rainfall depth (Figure 1-1). For rainfall events with a rainfall depth below 1 inch, the estimated CSO volume is below 20 MG. For larger rainfall events, the overflow volume increases with a ratio of approximately 30 MG per inch of rainfall depth.

The SWMM simulated CSO volumes at the four monitoring sites where CSO volumes are calculated (CSO4A, CSO25, CSO29, CSO30) amount to 302.9 MG. This difference with the CSO volumes calculated with measurements and standard hydraulic equations is explained in part by the discrepancy observed between the simulated and measured runoff volumes and, in part, by some mismatches observed between the model and the field with respect to conduit sedimentation and the operation of the 11th Street Pump Station.



# CSO Program Annual Report | 2014

Table 1-1 CSO Events and Durations at the Monitored Sites

Month	CSO site											
	CSO4A		CSO30		CSO17		CSO19		CSO29		CSO25	
	CSO Event	Overflow Duration (hours)	CSO Event	Overflow Duration (hours)	CSO Event	Overflow Duration (hours)	CSO Event	Overflow Duration (hours)	CSO Event	Overflow Duration (hours)	CSO Event	Overflow Duration (hours)
January	3	9.2	1	0.2	0	0.0	0	0.0	1	4.8	6	7.2
February	7	27.0	2	0.9	0	0.0	0	0.0	5	82.6	6	16.3
March	4	23.8	2	0.7	0	0.0	0	0.0	1	26.1	4	11.1
April	4	31.8	2	8.7	0	0.0	0	0.0	2	24.6	3	14.2
May	4	22.2	2	6.0	0	0.0	0	0.0	2	29.8	5	5.8
June	5	9.5	4	1.3	0	0.0	0	0.0	1	2.3	10	5.8
July	4	8.8	2	1.5	0	0.0	0	0.0	1	3.3	7	4.1
August	4	16.1	2	1.0	0	0.0	0	0.0	2	9.7	3	6.2
September	4	11.2	3	0.5	0	0.0	0	0.0	4	2.5	5	5.3
October	5	6.8	1	0.2	0	0.0	0	0.0	1	0.3	5	6.3
November	6	23.2	1	0.4	0	0.0	0	0.0	2	16.9	4	11.9
December	4	19.3	0	0.0	0	0.0	0	0.0	7	18.5	6	8.9
Total	54	208.8	22	21.3	0	0.0	0	0.0	29	221.5	64	103.0

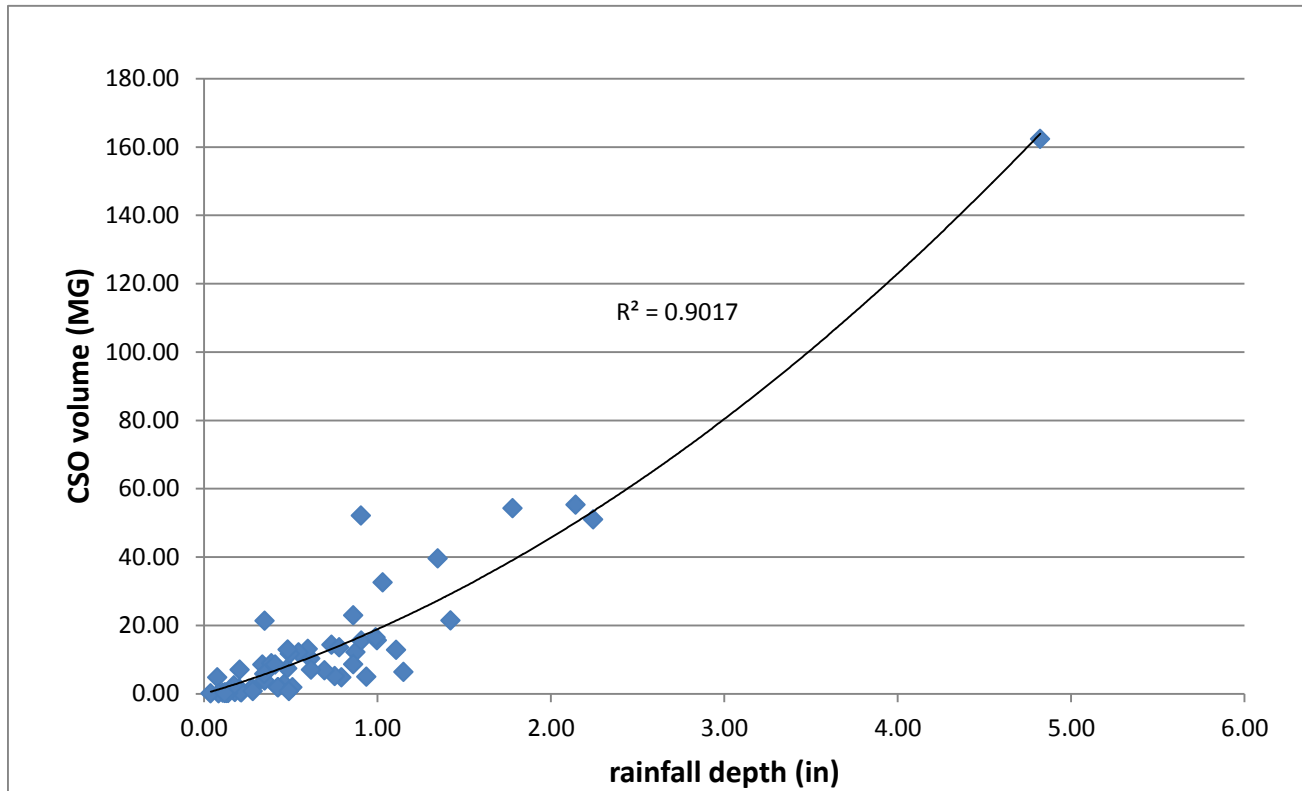
Table 1-2 CSO Volumes at the Monitoring Sites

Month	Overflow Volume (MG)				
	CSO4A	CSO30	CSO29	CSO25	total
January	11.3	0.7	0.2	0.9	13.2
February	56.8	1.6	8.2	2.3	69.0
March	53.9	4.2	4.5	1.2	63.9
April	101.2	42.2	12.7	2.5	158.6
May	41.1	7.2	3.4	0.8	52.5
June	26.6	5.0	0.3	0.9	32.8
July	27.4	23.9	1.2	0.9	53.4
August	48.5	11.6	3.3	0.9	64.3
September	17.0	6.7	0.1	0.6	24.4
October	12.5	0.8	0.0	0.8	14.0
November	39.6	2.2	1.3	1.8	44.9
December	41.7	0.0	0.4	1.3	43.4
Year	477.7	106.1	35.7	14.8	634.3



# CSO Program Annual Report | 2014

Figure 1-1 CSO Volume vs. Rainfall Depth



## 1.2. STORAGE PERFORMANCE SUMMARY

During the course of 2014, 204.6 MG were stored at Canby Park, Prices Run, Clements Run and Shipley Run (Table 1-3). These stored volumes directly contributed to the reduction of CSOs. Considering that the sewer system's storage capacity is 5 MG (i.e. 2.7 MG at Canby Park, 0.7 MG in Prices Run and 1.6 MG in Clements and Shipley Run), the total volume stored corresponds to the full use of the storage facilities 41 times. The average stored volumes per rainfall event were 41.3%, 107.6% and 103.7% for Canby Park, Prices Run, and Clements and Shipley Run respectively, demonstrating the ability of the RTC system to maximize the use of the storage capacity for CSO abatement in the presence of rainfall events with multiple peak rainfall intensities. In total the stored volumes have contributed to an annual reduction of the CSO volume by 19.5%.

The number of storage events recorded in the Prices Run and Clements and Shipley Run is higher than the number of rainfall events. This indicates that the RTC system was able to fill-up and dewater these storage facilities more than once during several of the rainfall events. This observation shows the ability of the control strategy to maximize the storage and conveyance capacities available in the collection system in order to minimize CSO volumes for rainfall events exhibiting several peak intensities. The average stored volume per rainfall event is 41.3%, 107.6% and 103.7% for Canby Park, Prices Run, and Clements and Shipley Run respectively.



## CSO Program Annual Report | 2014

In this report, a storage event starts when the stored volume exceeds the dry weather stored volume by more than 5% and ends when the volume returns to the same variation (i.e. when stored volume returns to within 5% of the dry weather stored volume).

In December, four rainfall events were recorded but only one storage event was observed at Canby Park for a total stored volume of 2.4 MG. The limited use of the storage tank is explained by the fact that for the first three rainfall events of December, the control valve CANBY\_FV\_2 was either manually controlled or fully opened due to a problem with the limitorque valve stem.

The solicitation time for Canby Park is 76.3 days. This is a significant time period considering that the other two storage facilities had solicitation times inferior to 17 days. This is explained by the maximal dewatering rate being allowed to surcharge the Silverbrook Run. Until July 27th, according to the rate of change of the stored volume, the dewatering rate of the storage tank was on average 1.2 MGD. Therefore, considering the storage capacity of the Canby Park storage tank (2.7 MG), more than 2 days were necessary for a complete dewatering. After the July 27th rainfall event (5-year return period with a 1-hour duration), the water level in the Silverbrook Run dropped by 0.7 ft in dry weather, indicating either a reduction of the blockage downstream or a reduction of the inflows. As a positive impact of this sudden level drop, the dewatering rate of the Canby Park storage tank increased by 0.8 MGD, passing from 1.2 MGD to 2 MGD.

According to the Canby\_FI\_30 flow meter, the dewatering rate of the Canby Park storage tank was an average of 3 MGD before July 27th and 3.5 MGD after. Considering that the stored volume of Canby Park is well known, this result indicates that the Canby\_FI\_30 flow meter overestimated the dewatering rate of the storage tank by at least 1.5 MGD, and therefore by the same amounts the flow rates recorded in the Silverbrook Run.

Table 1-3 Stored Volume Summary

Month	Storage Event			Stored Volume (MG)			Solicitation Time (days)		
	Canby Park	Prices Run	Clements and Shipley Run	Canby Park	Prices Run	Clements and Shipley Run	Canby Park	Prices Run	Clements and Shipley Run
January	2	4	7	7.7	2.5	8.0	7.0	1.2	3.5
February	3	7	7	7.0	4.9	10.7	15.6	2.5	2.9
March	3	5	7	5.5	2.7	10.2	5.7	1.8	1.5
April	4	7	8	7.4	5.1	12.1	8.1	2.1	1.6
May	3	4	5	4.2	3.2	7.7	9.9	1.4	1.5
June	4	10	9	6.2	6.5	11.4	6.6	1.1	0.9
July	6	6	6	5.8	3.9	7.0	4.7	0.7	0.5
August	3	4	3	5.6	3.0	6.7	2.4	1.0	0.8
September	4	5	5	4.1	2.6	7.0	3.8	0.9	0.6
October	5	5	8	3.4	3.3	6.2	3.9	0.7	0.5
November	5	5	5	5.3	3.2	4.4	6.1	1.9	0.8
December	1	3	4	2.4	2.8	4.9	2.6	1.2	0.8
Year	43	65	74	64.6	43.7	96.3	76.3	16.5	16.0





# CSO Program Annual Report | 2014

## 1.3. TREATED FLOW SUMMARY

In 2014, during the 360 days where pumped flow rates were available, 25,056 MG of flow were treated by the Regional WWTP (Table 1-4). Of this volume, 7,571 MG came from the City of Wilmington (Table 1-5) and 2,037 MG were runoff volumes. From the 2,037 MG of runoff volumes treated, 7.6% received primary and tertiary treatment only and 1.3% received only tertiary treatment. The average dry weather flow rate conveyed to the Regional WWTP is 64.2 MGD.

The average treated flow rate during CSO periods is 141.6 MGD. Therefore, on average, an additional 108.4 MGD could have been pumped by the 11th Street Pump Station during CSO periods without exceeding the primary treatment plant capacity. The average pumped flow rate at the 11th and 12th Street Pump Stations during CSO periods is 67.2 MGD, a value much lower than the 11th Street Pump Station's original configuration, which was designed for a total pumping capacity of 164 MGD with all five of the pumps in operation, or 147 MGD with four pumps, based on the theoretical system curve. In order to use the full pumping capacity before the appearance of an overflow, all of the available pumps should be activated before a level of 62 inches is reached in the wet well (5.9 ft NAVD88).

During the entire year of 2014, the 11th Street Pump Station has operated with 4 pumps running simultaneously only during the August 12th and 31st rainfall events. During these 2 events, the maximal pumped flow rate was 132.9 MGD.

Table 1-4 Regional WWTP Flow Summary

Month	Number of days with data	Average Dry Flow (MGD)	Treated Volume (MG)						Treated Flow Rate (MGD)	
			Dry Flow	Runoff	Total	Full treatment	primary and tertiary	tertiary	Max	Average during CSO Period
January	31.0	54.1	1678.5	192.0	1870.4	1868.6	1.8	0.0	209.9	122.2
February	28.0	66.8	1871.4	310.7	2182.1	2161.4	20.7	0.0	235.0	132.5
March	31.0	69.9	2168.0	187.4	2355.4	2338.2	17.2	0.0	228.5	154.7
April	30.0	74.4	2232.8	252.3	2485.0	2423.1	47.3	14.6	308.7	186.1
May	31.0	77.9	2414.6	273.8	2688.4	2616.0	60.2	12.2	308.7	195.5
June	30.0	68.5	2053.9	130.3	2184.2	2182.8	1.4	0.0	194.3	101.4
July	31.0	69.3	2148.6	73.4	2222.0	2220.0	2.0	0.0	195.9	115.4
August	31.0	61.0	1891.7	99.9	1991.6	1989.5	2.1	0.0	189.0	133.8
September	24.7	55.7	1374.4	85.9	1460.3	1460.0	0.4	0.0	182.2	101.7
October	31.0	59.0	1830.4	105.3	1935.7	1935.1	0.5	0.0	183.9	92.0
November	30.0	59.9	1797.5	154.0	1951.5	1949.9	1.6	0.0	188.8	130.2
December	31.0	50.2	1556.4	172.5	1728.9	1728.8	0.1	0.0	178.9	112.4
Year	359.7	64.2	23018.1	2037.4	25055.6	24873.4	155.3	26.8	308.7	141.6



# CSO Program Annual Report | 2014

Table 1-5 City of Wilmington Pumped Flow Summary

Month	Number of days with data	Average Dry Flow (MGD)	11th and 12th Street Pumped Volume (MG)			11th and 12th Street Pumped Flow Rate (MGD)	
			Dry Flow	Runoff	Total	Max	Average during CSO Period
January	31.0	14.6	451.2	120.7	571.9	99.1	53.0
February	28.0	22.1	618.4	188.2	806.6	109.1	55.2
March	31.0	17.5	543.8	115.5	659.3	96.2	67.4
April	30.0	20.6	618.1	149.8	767.9	113.8	87.2
May	31.0	21.5	666.1	141.9	808.0	105.2	84.8
June	30.0	18.6	558.1	92.5	650.6	105.9	69.2
July	31.0	18.6	577.3	60.4	637.7	115.2	68.3
August	31.0	17.4	540.0	86.7	626.6	132.9	85.2
September	24.7	12.3	302.9	70.2	373.1	106.4	69.9
October	31.0	13.3	412.3	74.7	486.9	105.0	67.6
November	30.0	14.2	426.4	124.9	551.2	107.0	60.4
December	31.0	16.8	520.4	109.1	629.5	106.0	57.3
Year	359.7	17.4	6234.9	1334.4	7569.3	132.9	67.2

## 1.4. CAPTURE RATE SUMMARY

In this report, the capture rate is defined as the fraction of flow volume recorded during the rainfall events, within the period under consideration, that was treated or stored and eventually treated (Figure 1-2). The capture rates were calculated using measurements with the exception of the CSO volumes associated with the 35 CSO sites where measurements are not available. At these sites, the CSO volumes used for the calculation of the capture rates are those simulated by the SWMM model. These SWMM simulated CSO volumes represent 24.8% of the total CSO volumes estimated in 2014.

For the 58 rainfall events observed in 2014, the City of Wilmington's capture rate was 75.6% (Figure 1-3). The rainfall event with the smallest capture was the one on July 27th with a capture rate of 43.9%. This was a short and intense rainfall event with a 5-year return period and a 1-hour duration. For the largest rainfall event recorded during the year, the April 29th event, the capture rate amounts to 60.9% (Table 1-6). During that rainfall event, 162.3 MG were overflowed.

For 2013, the annual capture rate reported for the City of Wilmington was 71%. However, this capture rate was computed with a slightly different definition (i.e., the capture runoff volume during an event to which is added the capture sanitary during rainfall plus two hours to account for runoff time). Using the capture rate definition adopted in the 2014 report, the capture rate for the year 2013 decreases to 68.6%. Therefore, using the same capture rate definition for the years 2013 and 2014, the capture rate observed for the year 2014, is 7% higher when compared to 2013.

That increase of the capture rate between 2013 and 2014 must be interpreted carefully and does not necessarily indicate an improvement of the RTC system performance. Capture rates can significantly vary from one rainfall to



## CSO Program Annual Report | 2014

---

another depending on the rainfall characteristics (e.g., rainfall depth, maximal intensity, heterogeneity). Therefore, capture rates can be used to assess the RTC system performance only when computed for large periods of time for which the rainfall events have similar statistical properties. On a yearly basis, where only 50 to 60 rainfall events are recorded, the statistical properties of the rainfall events may differ enough to affect the capture rate by several percent assuming the same RTC system performance. A better metric to assess the improvement or the decrease of the RTC system performance, is the difference existing between the observed and the optimal capture rates.

The optimum capture rate for the City of Wilmington is 95.5%. This corresponds to a gap of 19.9% with the observed capture rate (75.6%), which is explained in large part by the presence of downgraded operating modes during rainfall events. When the RTC system is operated in a downgraded mode, the control objective is no longer to minimize CSO volumes but rather to guarantee safe operation of the collection system. In 2014, the RTC sites were operated in a downgraded mode on average 5.8% of the time. However, 88.9% of the overflows recorded at the three controlled sites (CSO4A, CSO30, Canby Park) were observed during that period.

The large majority of the overflows were observed under operating mode 9. At the RTC sites, 83% of the overflow volumes were recorded under this operating mode, which is activated in the presence of a high-high water level alarm. At Canby Park, high-high water levels alarms are mainly caused by debris limiting the conveyance capacity of the Silverbrook Run to approximately 4.5 MGD. At CSO4A and CSO30, high-high water level alarms are mainly caused by the operation of the 11th Street Pump Station. To decrease the appearance of operating mode 9 at these two sites, the start and stop levels of the 11th Street Pump Station's lag pumps will need to be lower.

The difference between the optimal capture rate (95.5%) and the observed capture rate (75.6%) can also be explained, in large part, by the presence of local hydraulic constraints. At the CSO4A and CSO30 sites, undesired overflows were caused by the operation of the 11th Street Pump Station. Currently, Pump 3 (model 30MC-1) is out of service because it reached the end of its useful life and was not replaced. Moreover, during a large part of 2014, only three pumps were in the "Auto" mode allowing only three of the five original pumps to run simultaneously. During the period where 4 pumps were in the "Auto" mode, the pumping station operated with four pumps simultaneously only for short periods of time on August 12th and 31st due to the pumps high start levels. Finally, the lag pumps start levels defined during the course of 2014 did not enable to run more than two pumps simultaneously before the appearance of an overflow at CSO4A. As a consequence of all these observations, the average pumped flow rate during CSO periods amounted to only 67.2 MGD in 2014.

Based on the SWMM model, the limited capacity of the CSO24 and CSO4D regulating flow structures also affected the capture rate. Overflows are simulated at these two sites during periods where the flow rate conveyed to the 11th Street Pump Station is inferior to its pumping capacity. In the model, the capacities of the CSO24 and CSO4D flow regulation structures are 0.8 MGD and 3.0 MGD respectively. The CSO volume simulated at the CSO24 and CSO4D sites represents 18.7% of the overflow volume estimated in 2014.



# CSO Program Annual Report | 2014

Figure 1-2 Capture Rate Definition

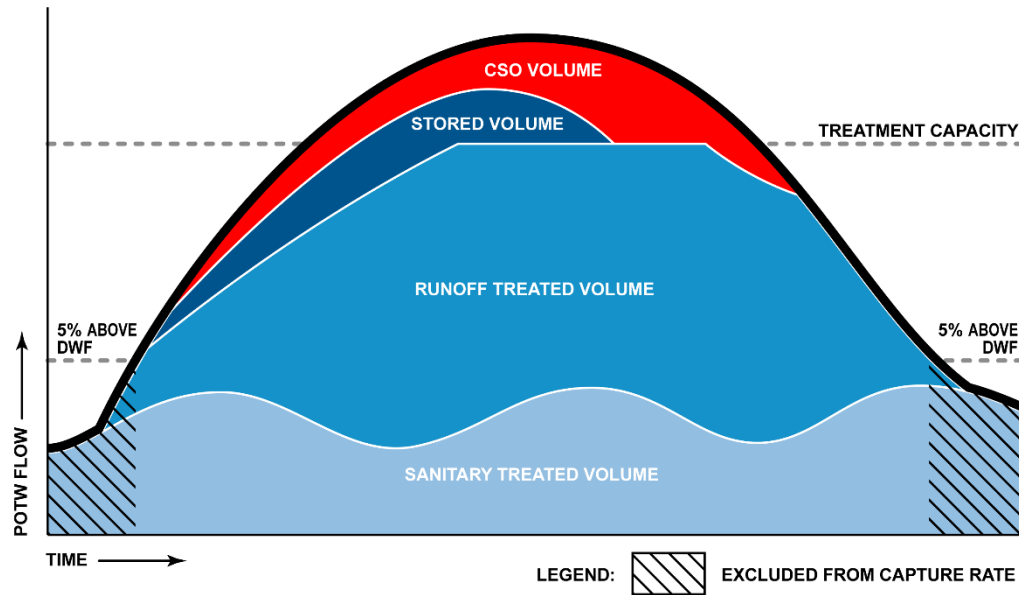
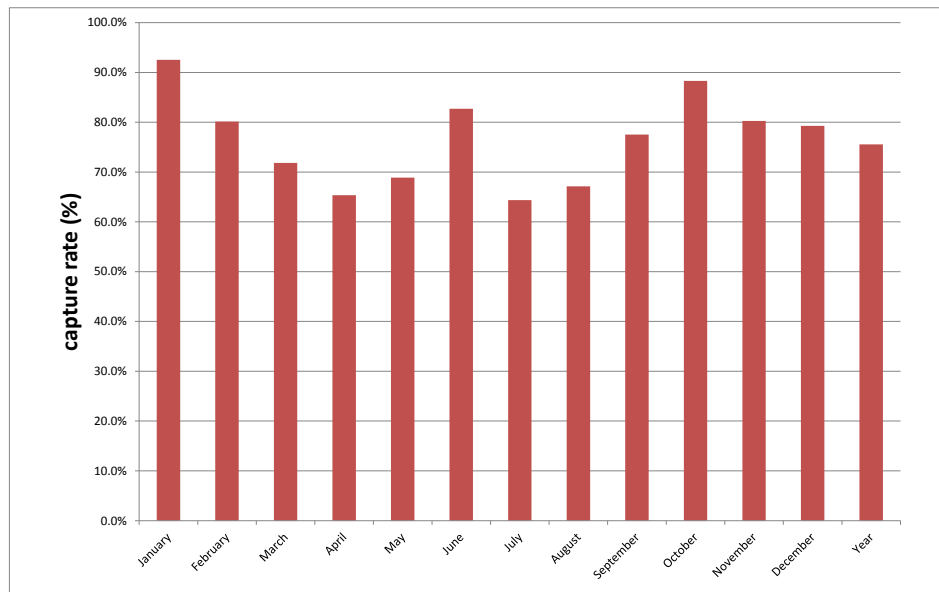


Figure 1-3 Monthly Capture Rate





# CSO Program Annual Report | 2014

Table 1-6 Capture Rates for Rainfall Events

rainfall event	starting date	ending date	rainfall depth (in)	CSO volume (MG)	treated volume (MG)	stored volume eventually treated* (MG)	Capture rate (%)
1	2014-01-05 06:30	2014-01-07 02:20	0.79	4.7	67.5	2.3	93.7%
2	2014-01-10 04:00	2014-01-12 07:00	0.87	12.1	86.4	2.2	88.0%
3	2014-01-14 00:00	2014-01-15 05:10	0.22	0.2	37.6	0.2	99.4%
4	2014-01-27 02:15	2014-01-28 00:30	0.12	0.3	18.0	0.0	98.3%
5	2014-02-03 01:30	2014-02-04 02:00	0.91	15.4	52.0	2.5	78.0%
6	2014-02-04 23:00	2014-02-06 09:50	0.90	52.0	86.6	0.9	62.7%
7	2014-02-13 07:30	2014-02-16 04:55	1.15	6.3	126.7	2.0	95.4%
8	2014-02-18 10:00	2014-02-18 21:00	0.18	0.4	16.7	0.0	97.9%
9	2014-02-19 08:30	2014-02-19 23:15	0.38	7.5	34.1	2.4	83.0%
10	2014-02-21 12:00	2014-02-21 23:00	0.08	4.7	25.3	-1.4	83.6%
11	2014-03-12 18:00	2014-03-13 03:00	0.34	8.4	15.8	0.5	66.1%
12	2014-03-15 15:00	2014-03-20 01:30	0.61	10.2	25.4	2.8	73.4%
13	2014-03-28 19:30	2014-03-31 18:20	2.14	55.2	140.5	3.1	72.2%
14	2014-04-07 14:00	2014-04-08 12:00	0.60	13.0	39.7	1.7	76.2%
15	2014-04-15 08:00	2014-04-16 08:30	1.00	15.6	52.4	2.3	77.9%
16	2014-04-25 17:00	2014-04-26 07:20	0.48	7.3	24.0	0.8	77.3%
17	2014-04-29 09:30	2014-05-02 21:25	4.82	162.3	250.0	2.5	60.9%
18	2014-05-03 19:00	2014-05-04 11:30	0.13	0.1	22.2	-0.4	99.3%
19	2014-05-10 20:00	2014-05-11 10:00	0.39	8.8	19.8	0.7	69.8%
20	2014-05-16 04:20	2014-05-17 05:10	1.35	39.5	55.5	2.4	59.5%
21	2014-05-27 15:45	2014-05-28 04:00	0.35	3.7	15.1	0.4	80.6%
22	2014-06-04 22:25	2014-06-05 22:25	0.55	11.9	32.0	0.6	73.2%
23	2014-06-09 00:00	2014-06-09 17:00	0.28	1.6	19.2	0.0	92.2%
24	2014-06-10 05:20	2014-06-11 03:00	0.75	5.0	31.7	1.4	86.8%
25	2014-06-11 21:55	2014-06-13 19:55	0.86	8.6	77.1	1.7	90.2%
26	2014-06-18 23:10	2014-06-19 12:55	0.20	1.5	14.9	0.0	90.8%
27	2014-06-25 14:30	2014-06-26 07:15	0.73	14.2	26.5	0.0	65.1%
28	2014-07-02 16:30	2014-07-03 03:40	0.21	0.3	11.6	0.0	97.1%
29	2014-07-08 18:15	2014-07-09 04:15	0.13	0.2	10.0	0.0	97.8%
30	2014-07-10 22:00	2014-07-11 10:00	0.11	0.2	10.7	0.0	98.3%
31	2014-07-14 16:00	2014-07-15 06:50	0.99	16.4	23.6	1.1	60.1%
32	2014-07-15 14:15	2014-07-16 13:00	0.28	0.7	28.4	-0.1	97.6%
33	2014-07-23 18:00	2014-07-24 04:45	0.41	8.4	16.5	1.0	67.6%
34	2014-07-27 21:45	2014-07-28 20:40	1.78	54.2	41.0	1.3	43.9%
35	2014-08-01 23:30	2014-08-02 12:20	0.35	5.7	19.7	0.0	77.6%
36	2014-08-02 22:20	2014-08-03 13:10	0.14	0.1	16.2	0.0	99.3%
37	2014-08-12 09:00	2014-08-13 20:30	2.24	51.0	83.4	1.6	62.5%
38	2014-08-31 13:10	2014-09-01 10:00	1.42	21.4	36.7	2.1	64.5%
39	2014-09-02 17:10	2014-09-03 04:55	0.17	2.3	13.7	0.0	85.6%
40	2014-09-06 14:30	2014-09-07 06:35	0.50	11.6	19.2	1.4	64.0%
41	2014-09-13 11:15	2014-09-14 01:25	0.48	12.8	20.6	0.2	61.9%
42	2014-09-24 19:55	2014-09-25 22:45	0.94	4.9	41.1	0.8	89.6%
43	2014-09-29 14:30	2014-09-30 13:10	0.08	0.1	12.1	0.0	99.6%
44	2014-10-03 22:10	2014-10-04 18:25	0.46	2.7	27.7	0.2	91.1%
45	2014-10-07 22:50	2014-10-08 07:40	0.20	6.9	11.9	-0.1	63.0%
46	2014-10-10 22:15	2014-10-11 22:45	0.43	1.8	26.1	0.7	93.8%
47	2014-10-13 10:55	2014-10-14 00:30	0.04	0.0	10.3	-0.2	100.0%
48	2014-10-15 07:40	2014-10-16 19:50	0.69	6.8	44.8	0.3	86.9%
49	2014-10-22 01:35	2014-10-23 10:00	0.42	1.8	29.4	0.0	94.2%
50	2014-11-01 03:50	2014-11-02 02:50	0.62	6.9	33.4	-0.3	82.7%
51	2014-11-05 21:55	2014-11-07 02:55	0.51	1.8	37.6	0.2	95.5%
52	2014-11-13 15:45	2014-11-14 13:50	0.12	0.1	15.2	0.0	99.3%
53	2014-11-16 16:10	2014-11-18 05:05	1.11	12.7	57.2	1.2	82.1%
54	2014-11-26 01:50	2014-11-27 22:15	1.03	32.5	73.7	1.3	69.8%
55	2014-12-01 12:30	2014-12-04 01:45	0.49	0.6	61.9	0.2	99.0%
56	2014-12-05 14:30	2014-12-07 10:50	0.78	13.5	65.4	0.0	82.9%
57	2014-12-08 22:20	2014-12-09 21:00	0.35	21.2	35.7	0.0	62.7%
58	2014-12-23 21:05	2014-12-25 03:35	0.86	22.9	57.4	2.2	72.3%

\*A negative stored volume corresponds to the situation where the volume stored at the end of the rainfall event is inferior to the volume stored at the beginning of that same rainfall event



# CSO Program Annual Report | 2014

## 2. FINAL LONG TERM CONTROL PLAN (FLTCP)

### 2.1. FLTCP APPROACH OVERVIEW

The Final LTCP will (1) complete the implementation of ELTCP projects which remain underway, (2) document the effects of the past projects on the system performance, and (3) embark on implementing key elements using an integrated and adaptive management watershed approach to land, water, and infrastructure to maintain and enhance compliance with the TMDL WLAs for the Christina Basin

Following the principles of adaptive management, the proposed approach includes a significant effort dedicated to evaluation of impacts of previous CSO related projects and programs. At this moment the Real Time Control Center is capturing new data that is critical not only to the real time application of Csoft hydraulic software, but also integral to developing data for extended period (multi-year) simulations to measure CSS performance. On-going performance measurement and evaluation requires an updated XP-SWMM model of the CSS in order to perform extended period simulations. RTC implementation and other completed key projects and activities achieve a high level of capture. Consequently, future efforts to achieve even greater CSO reductions will require capture of significantly larger storms or very site specific projects at a few remaining overflow locations.

Traditional infrastructure options to achieve further CSO reductions are anticipated to be exhausted due to their location and size or identified as too disruptive to the fabric of the City to achieve the remaining few percent capture of the overflows. Therefore, an approach favoring green infrastructure and source controls will be developed to achieve sustainable long term reductions in these small remaining overflow locations and potentially city wide. This approach is consistent with current US EPA green initiatives. If a source control approach is implemented city wide it not only offers the ability to reduce flows into the system and to further reduce overflows, but it may also provide synergy with current projects to achieve reductions beyond what was anticipated.

Wilmington's FLTCP joins cities such as Washington D.C., Philadelphia, Chicago, Cincinnati, Portland, Seattle, New York City, and Kansas City that have elements or a comprehensive approach to reducing CSOs using green infrastructure. These programs state that green infrastructure is the most sustainable approach to addressing CSOs the greatest social, economic, and environmental benefits compared to a traditional approach. Given the factors described above, the City has embarked on developing its own green infrastructure program during the Final LTCP.

### 2.2. FLTCP CSO OBJECTIVES

Maintain compliance with CSO TMDL WLAs for the Christina Basin.

Evaluate the performance and effects of the key CSO projects for the Christina Basin. Re-evaluate and reprioritize the CSO outfalls based on the measured and anticipated impacts of the implementation and operation of the key CSO projects on CSO discharges.

Implement cost effective projects and activities to achieve reasonable further progress.

Develop and establish a source control and green infrastructure program to obtain cost-effective and sustainable additional long term CSO reductions and benefits.





# CSO Program Annual Report | 2014

Continue to pursue and identify pollution sources upstream of the City's CSO areas.

Continuation of compliance and performance of the Nine Minimum Controls.

The following section provides detailed information about the specific projects, deliverables, and schedules for implementation during the Final LTCP. Table 2-1 provides a summary of implementation projects and their status.

Table 2-1 FLTCP Project Status

Project ID	Description/Title	Deliverable	Deadline	Actual Status
<b>KEY CSO PROJECTS</b>				
K1	Real Time Control System Construction completion	In 2011, the City will complete the construction and implementation of the Real Time Control system.	Oct 1, 2015	Construction Complete.
K2	Real Time Control System full operation	By 2012 the 2nd phase of Real Time Control system will be complete and the system will be fully operational, as described above.	Oct 1 2015	Fully operational.
K3	Elimination of Rockford Road for average year	By 2014, the City will have eliminated CSO discharges from the Rockford Road CSO outfall in the average year condition.	Oct 1 2016	CSOs were eliminated up to a 2-year storm event, or a rainfall intensity of 2.2 inch/hour for a 24 hr period. Verification underway.
K4	11th St. Pumping Station re-evaluation study	A re-evaluation of options and capabilities to manage the larger storm events for the 11th St. Pumping Station will be conducted including examining new alternatives and an implementation plan will be developed, if appropriate.	Oct 1, 2015	Preliminary analysis completed by Tetra Tech. Pumping beyond 135 MGD is not feasible due to upstream and downstream restrictions. Technical memo to follow.
K5	Prices Run Diversion re-evaluation study	A re-evaluation of options to manage the larger storm events for Prices Run will be conducted including examining new alternatives and an implementation plan, if appropriate.	Oct 1, 2015	Preliminary analysis completed by Tetra Tech. Pumping beyond 135 MGD is not feasible due to upstream and downstream restrictions. Technical memo to follow.
<b>NEW PROJECTS</b>				
N1	WWTP Headworks upgrade construction completion	In 2011, the City will complete construction of upgrades linking the Real Time Control System to the WWTP headworks. This project eliminates hydraulic bottlenecks at the primary and secondary bypasses at the WWTP.	Oct 1, 2015	Construction complete.
N2	Plan for Kentmere & Union elimination for average year	The City will assess overflow volumes and frequencies at the Kentmere & Union CSO and identify specific projects, programs, and schedule to eliminate the Kentmere & Union CSO	Oct 1, 2015	Plan under development.



# CSO Program Annual Report | 2014

Project ID	Description/Title	Deliverable	Deadline	Actual Status
		in the average year.		
N3	WWTP headworks upgrade full operation	The City will conduct full operation of the upgrades linking the Real Time Control System to the WWTP headworks for bypass of wet weather flows in excess of 168 mgd.	Oct 1, 2015	Fully operational.
N4	Kentmere & Union elimination for average year	The City will implement projects from the Kentmere & Union Plan to eliminate the Kentmere & Union CSO in the average year.	Oct 1, 2018	Construction documents out to bid.
<b>SEWER SEPARATION PROJECTS</b>				
S1	Complete sewer separation of Wilmington Hospital	The Wilmington Hospital Sewer Separation Project will remove an estimated 10 acres of drainage from the CSO system. The construction will be completed and estimates of the reduction of related CSOs will be provided.	Oct 1, 2017	Construction complete. Monitoring being planned with larger CSO monitoring plan.
S2	Identify new development projects or desired areas for potential sewer separation and develop a special area management plan	Parcels with waterfront access over one acre will be compared with current City Plans and future planned development to identify opportunities for separation from the CSO system during construction. A plan identifying and prioritizing potential parcel clusters for separation during development with conceptual separation designs and related cost and technical analyses will be completed by the end of permit cycle.	Oct 1, 2018	Efforts are focused on the separation of the South Wilmington area and stormwater wetland park.
<b>GREEN INFRASTRUCTURE PROJECTS/ACTIVITIES</b>				
G1	Feasibility Study of Leveraging Stormwater Utility Credits To Incentivize Source Controls	A study with recommendations for the City to implement to increase source controls through its current impervious cover parcel based stormwater billing approach.	Oct 1, 2015	Analysis ongoing.
G2	Feasibility Study of Stormwater Ordinance	A study with recommendations for the City to implement some form of stormwater ordinance in order to gain additional source controls through requiring specific stormwater management controls with development and redevelopment projects.	Oct 1, 2016	The City has paused these efforts while it reviews DNREC's stormwater regulations.



## CSO Program Annual Report | 2014

Project ID	Description/Title	Deliverable	Deadline	Actual Status
G3	Plan for green infrastructure initiatives in public street projects	A study with recommendations for the City to implement in order to gain additional source controls through implementing a variety of initiatives to manage stormwater from public streets.	Oct 1, 2017	ongoing
G4	Plan for green infrastructure initiatives in public building projects	A study with recommendations for how the City processes and standards would need to change in order to gain additional source controls through implementing a variety of initiatives to manage stormwater from public buildings and properties.	Oct 1, 2017	ongoing
G5	Plan for green infrastructure initiatives in private properties	A plan with recommendations for the City to implement in order to gain additional source controls through implementing a variety of initiatives to manage stormwater on private property.	Oct 1, 2017	The City has paused these efforts while it reviews DNREC's stormwater regulations.
G6	Study of code changes to support green infrastructure	A study with recommendations for the City to implement in order to identify ways City codes can be adjusted to facilitate green infrastructure.	Oct 1, 2017	Study complete.
<b>POST CONSTRUCTION MONITORING PROJECTS</b>				
P1	Upgrade of CSS Model	A CSS Model that includes up to date impervious cover and runoff information, key CSO projects, green infrastructure modeling capabilities, etc.	Oct 1, 2018	In Planning
P2	Flow monitoring plan to support CSO model	A flow monitoring plan of the CSO discharges related to key CSO projects and CSOs that require additional attention.	Oct 1, 2015	In Planning
P3	Modeling Plan to Verify CSO percent capture and Achievement of Christina TMDL loads	A plan of modeling activities and outputs to estimate the CSO percent capture and compliance with the Christina TMDL loads will be developed and provided. The plan will be executed by the end of the permit.	Oct 1, 2015	In Planning
P4	Develop Final LTCP benchmark/baseline for CSO discharges & reprioritization of outfalls, as appropriate.	A report providing the benchmark of the current CSO discharges and CSS performance due to completion of the ELTCP including prioritization of CSO outfalls based on their compliance with required TMDL loads, discharge volume, and discharge frequency will be provided.	Oct 1, 2017	This activity is dependent upon the implementation and optimization of the RTC and 11 <sup>th</sup> St Pump Station and item #6 from the permit. Once these are complete then a new benchmark and outfalls can be reprioritized.



# CSO Program Annual Report | 2014

## 2.3. CSO PRIORITIES AND PROJECTS

### 2.3.1. STATUS AND DISCUSSION OF PRIOR KEY CSO PROJECTS (K\_)

In this section the scope of each of the projects, as defined in the LTCP, will be described in detail as well as the status of specific deliverables to DNREC.

#### K1 - Real Time Control System Construction

**Deliverable:** The City will complete construction and implementation of the Real Time Control system.

**Deadline:** October 1, 2015

**Scope:** The Real Time Control system (RTC) was identified in the 2003 ELTCP as an opportunity to improve performance of the existing combined sewer system by dynamically reacting to changes. Model analysis and results suggests that completion of the RTC system achieves an estimated system wide 92% capture.

Real Time Control in a sewer system utilizes real time monitoring data of rainfall, water levels and/or flows. Changes in their values trigger movements of sluice gates, or pump speed to regulate the flow in the Collection System. RTC is based on a Global Optimal and Predictive strategy. A "Global" strategy means that all regulators are controlled according to the conditions of the CS as a whole. The "Predictive" strategy uses the rainfall data to predict incoming flows in the CSS. The "Optimal" strategy consists in defining an objective function that minimizes overflow and maximizes inflows to the WWTP.

RTC system provides improved flow management in the CSS through an integrated system of flow monitoring, flow control devices and control software. The primary objective is to optimize, on a real time basis, in-system storage and routing of flow. Wilmington's RTC system originally comprised a four-site system to regulate and optimize flows in CSO areas 4A, 25 and 30 and at the Canby Park existing storage tank. The following system components were designed and are in the process of being constructed:

Regulator control devices, consisting of sluice gates and bending weirs into the interceptors to optimize use of available interceptor capacity.

Flow monitoring system at key locations in the interceptor and at the controlled regulators.

RTC control software, consisting of a control module based on a customized linear optimization program, integrated with the XP-SWMM hydraulic model.

Telemetry systems including programmable logic controller (PLC) and radio units

A central control station located at the WWTP.

RTC Design and construction was divided into two distinct phases. Phase I focused on developing the Supervisory Control and Data Acquisition (SCADA) backbone for the RTC system. Construction of Phase I was completed in 2009, and included the construction and interconnection of five rain gauges at distributed locations in the City and one flow monitor in interceptor A. Phase I construction also included development and installation of a composite SCADA system at the City's wastewater treatment plant.



## CSO Program Annual Report | 2014

---

RTC Phase II construction is focused on mechanical and civil engineering elements of the integrated system. This includes specific mechanical controls at CSOs 25, 4A, 30 and at Canby Park storage tank as well as controls at the Brandywine, Rattlesnake Run, and Christina siphons. While the mechanical weir or gate controls at the CSO outfalls are for overflow minimization during storms, the controls at the siphons are directed to optimize flushing flows to prevent sedimentation during dry weather flow. This will in turn maximize capacity of the siphons during wet weather. Phase II elements include installation and operation of sluices, gates, weirs, and their respective controls. This Phase began in 2010 and will be completed by late 2011.

**Status:** Construction of the Real Time Control System as described in the City of Wilmington's Final Long Term Control Plan (FLTCP) dated August 2013, was completed in 2012. The system uses a combination of regulators, control devices, flow monitoring, control software, and telemetry to reduce combined sewer overflows (CSO's) in the City of Wilmington.

### K2 - Real Time Control System Full Operation

**Deliverable:** The City will complete the second phase of the Real Time Control system and the system will be operational.

**Deadline:** October 1, 2015

**Scope:** As described above.

**Status:** The City has implemented full operation of the Real Time Control System as described in the City of Wilmington's Final Long Term Control Plan (FLTCP) dated August 2013. The system uses a combination of regulators, control devices, flow monitoring, control software, and telemetry to reduce combined sewer overflows (CSO's) in the City's combine sewer system. While full operation of the system has been achieved, the City continues to work towards achieving the goal of 92% capture of average annual CSO volumes outlined in the FLTCP. To date, the City has achieved average annual capture rates ranging from 71 - 75% of the average annual flow. The City is working to implement operational changes in the real time control system and 11th Street Pump Station. Model simulations of these changes predict that these changes will increase capture rates to above the EPA goal of 85% and closer to our proposed goal of 92%. We expect the operational changes to be implemented January 2016. The results of these changes will be described in the 2016 CSO Program Annual Report.

The City is also working to resolve issues previously identified during the optimization process. Those issues are adjusting system set points, removing grit and ragging in interceptors, improving monitoring and network equipment reliability, 11<sup>th</sup> Street Pump Station lag pump start levels, structural constraints limiting flow conveyance to the 11<sup>th</sup> Street Pump Station, and the optimal flow set point in the Silverbrook Interceptor due to the pinch valve for Canby Tank.

### K3 - Elimination of Rockford Road for Average Year

**Deliverable:** City will eliminate CSO discharges from the Rockford Road CSO outfall in the average year condition.

**Deadline:** October 1, 2016

**Scope:** Currently, construction for the Rockford Road CSO Sewer Separation Project is complete. New stormwater pipes and catch basins have been installed within Red Oak Road, Riverview Avenue, and Delaware Avenue. Existing catch basins within the CSO drainage area have been rerouted to connect to the new



## CSO Program Annual Report | 2014

---

stormwater system. The Downspout Disconnect Project has successfully completed construction for 39 of the 67 residential properties. Of the total 123,495 square feet of roof area, 54,582 square feet, or 44%, have been disconnected from the CSO drainage basin. The solutions for 5 additional homes have been developed and are awaiting construction, while 4 more properties are in the design phase. Construction is expected to be complete by the end of 2010.

The hydraulic model for the project was updated to reflect the anticipated success of the projects by year 3 of the permit. Overall, 57% of the roof leaders are expected to be removed from the system. The disconnected roof area and the street runoff that was separated from the combined system were incorporated into the model. In addition, the weir at the first interconnection at the intersection of Red Oak Road and Riverview Avenue was raised. Raising the weir permits 1.25 MGD to pass through the pipe in Red Oak Road. While surcharging in manholes occurs due to raising the weir, water levels are not anticipated to cause basement backups. With the weir raised and surcharging allowed, occurrence of overflows will be eliminated to greater than the 2-year storm and nearly the 5-year storm. If in-system problems result, the City will reevaluate the weir level.

**Status:** Disconnected 54% of rooftop area and separated street runoff. Subsequent CSOs into the Brandywine were eliminated up to a 2-year storm event, or a rainfall intensity of 2.2 inch/hour for a 24 hr period. See CSO Program 2013 Annual Report Final Long Term Control Plan for additional information. Verification is underway.

### K4 - 11<sup>th</sup> Street Pumping Station Re-evaluation Study

**Deliverable:** A re-evaluation of options and capabilities to manage the larger storm events for the 11<sup>th</sup> St. Pumping Station will be conducted including examining new alternatives and an implementation plan will be developed, if appropriate.

**Deadline:** October 1, 2015.

**Scope:** A preliminary evaluation of the 11th Street Pumping Station was performed to identify the feasibility of upgrading the capacity of the existing station. Based on this 2003 evaluation, replacing pump impellers, drives and ancillary equipment, existing pumps could be upgraded to provide a peak capacity of 200 mgd, with four pumps in operation and one pump as a backup. Based on this, in 2003 the proposed capacity upgrade appeared to be a cost-effective CSO control measure. In order to ensure existing pump station capacity, the City replaced two pumps as part of ongoing preventive maintenance. Current pump station capacity of 135 MGD is considered sufficient for a large range of events based on hydraulic modeling. In the ELTCP, the increase in pumping capacity from 135 MGD to 200 MGD only gains another 1.5% capture because it only allows for interception of high peak flows from infrequent events. This made the project of limited value given project costs. Instead, the City decided to evaluate more cost-effective options.

Furthermore, after 2003, a more detailed hydraulic examination of the 11<sup>th</sup> St. Pumping Station was completed. This analysis revealed that the increase in pumping capacity would result in cavitation due to hydraulic limitations upstream and downstream of the pump station in the system. A new pump station would need to be built around the existing operating station and a new transmission pipeline constructed in order to address these hydraulic limitations. These additional elements made this project much more complex, cost-ineffective, and required significant reevaluation. Therefore, during the next permit period, the City proposes to evaluate the impact of other key CSO control projects, such as Real Time Control, and examine other alternatives to achieve the same or





## CSO Program Annual Report | 2014

---

better results. Also, in partnership with DNREC, the City proposes to explore other more sustainable options to reduce flow to the pump station from New Castle County contributions outside the City.

**Status:** The City continues to evaluate the impact of other key CSO control projects, such as Real Time Control, and examine other alternatives to achieve the same or better results. Also, in partnership with DNREC, the City proposes to explore other more sustainable options to reduce flow to the pump station from New Castle County contributions outside the City. The City conducted an analysis of the flows to the headworks of the WWTP to determine if capacity would be available during wet weather periods for additional 11<sup>th</sup> St. pumping station discharges. The modeling and design work done to implement the RTC system indicate that an implementation plan is not necessary at this time provided the RTC performance goals are achieved. A formal technical memorandum will be completed in 2016.

### K5 – Prices Run Diversion Re-evaluation Study

**Deliverable:** A re-evaluation of options to manage the larger storm events for Prices Run will be conducted including examining new alternatives and an implementation plan, if appropriate.

**Deadline:** October 1, 2015.

**Scope:** This project proposed the construction of a new interceptor to convey excess wet weather flows from the Prices Run Interceptor system directly to the 11th Street Pumping Station. This project was developed to reduce overflows from CSO 4A and integrate with the RTC system in order to free up capacity in Interceptor A. The proposed diversion interceptor, comprising approximately 2,300 linear feet of 36-inch diameter pipe, was planned to connect to the existing Prices Run relief sewer downstream of the regulator and upstream of CSO 4A outfall. This project was originally proposed in the 2003 ELTCP for completion in 2010.

This project has been temporarily put on hold because further analysis during RTC development indicated it would not be cost effective. Additional overflow volume reduction would be minimal for a substantial capital cost. As stated previously, without this project, and with RTC, 92% system wide capture is met.

**Status:** The City conducted an analysis of the flows from Prices Run to 11<sup>th</sup> St. Pump Station. The modeling and design work done to implement the RTC system indicate that an implementation plan is not necessary at this time provided the RTC performance goals are achieved. A formal technical memorandum will be completed in 2016.

---

### 2.3.2. STATUS AND DISCUSSION OF NEW CSO PROJECTS (N\_)

During the course of the implementation of the 2003 ELTCP, several new projects were identified for implementation. These projects either addressed a priority area or potential system limitations. In this section the scope of each of the projects will be described along with the specific deliverables to DNREC for each item.

### N1 – WWTP Headworks Upgrade Construction

**Deliverable:** The City will complete construction of upgrades linking the Real Time Control System to the WWTP headworks. This project eliminates hydraulic bottlenecks at the primary and secondary bypasses at the WWTP.

**Deadline:** October 1, 2015



## CSO Program Annual Report | 2014

---

**Scope:** The goal of the headworks upgrade is to add automatic controls on gates and screens in order to maximize the amount of peak wet weather flow processed at the treatment plant. This includes more capability to bypass to primary lagoons with the installation of bending weirs at the grit tanks and slide gates at the secondary bypass chamber. The upgrade improvements will allow the WWTP to achieve full 400 mgd peak flow capacity during wet weather. Currently during peak flow situations, the City needs to cut back below 135 MGD at 11th Street Pump Station due to uncontrollable flows coming from the County force mains. Final LTCP percent capture is based on pumping the full 135 MGD at 11th Street. The WWTP headworks improvement project has been designed and bids for construction have been received. The construction cost is \$2.7M, with another \$0.2M in construction engineering support services.

**Status:** The city of Wilmington has substantially completed the construction of the WWTP Headworks Upgrade Construction as described in the City of Wilmington's Final Long-Term Control Plan (FLTCP) dated August 2013. The key components of the project include modifications which allow the capability to bypass to primary lagoons with the installation of bending weirs at the grit tanks and automated slide gates at the secondary bypass chamber. The construction was substantially complete by the spring of 2012, however during approval testing there were concerns with leakage of the premature tipping of the primary bypass bending weirs. We expect all contractual and operational issues to be resolved in the by end of October 2015.

### N2 – Plan for Kentmere & Union CSO Elimination for Average Year

**Deliverable:** The City will assess overflow volumes and frequencies at the Kentmere & Union CSO and identify specific projects, programs, and schedule to eliminate the Kentmere & Union CSO in the average year.

**Deadline:** October 1, 2015

**Scope:** During the implementation of the ELTCP a new combined sewer overflow was located at Kentmere & Union above the City's drinking water intake. The City will develop a plan that estimates frequency of the overflows at the Kentmere & Union CSO and identifies specific projects, programs, and schedule to eliminate the Kentmere & Union CSO in the average year. This plan may include partial separation of stormwater from streets, the implementation of the Source Water Ordinance controls, and other elements including rainbarrel programs.

**Status:** After the development of the City's Long Term Control Plan a previously undocumented Combined Sewer Overflow (CSO #32) was discovered at Kentmere and Union upstream of the City's drinking water intake. As such, it was reported to DNREC in the FLTCP and the City has been investigating ways to eliminate it.

The approach to address the overflow at Kentmere and Union was based upon conducting activities to reduce the runoff and divert it from the system through separation of public right of way drainage areas. Private areas will be addressed over the long term through development and there was not a more immediate way to address runoff from private properties.

To minimize the overflows from CSO #32, located near the intersection of Union Street and Kentmere Parkway, design drawings and construction documents were proposed to separate the storm sewer system along Kentmere Parkway. This separate storm sewer system will extend from Wood Road near the Delaware Art Museum to a point approximately 200 feet east of Union Avenue, where the storm drain system will drain into the Crooked Run stream. This storm drain system will direct the storm runoff from Kentmere Parkway and the intersecting streets of Wood Road, Bancroft Parkway, Grant Avenue and Union Street into the separate storm sewer system instead of



## CSO Program Annual Report | 2014

---

the draining into the combined sewer system. This project will remove approximately 18 acres of drainage area from the combined sewer system.

The City has implemented the separation project and it will be completed by January 2016. Once the project is constructed monitoring equipment will be installed to measure its effectiveness as compared with the stated FLTCP goal of eliminating the CSO in the average year. If post construction monitoring indicates that the goal has not been achieved, then additional options will be investigated.

### N3 – WWTP Headworks Upgrade Full Operation

**Deliverable:** The City will conduct full operation of the upgrades linking the Real Time Control System to the WWTP headworks for bypass of wet weather flows in excess of 168 MGD.

**Deadline:** October 1, 2015

**Scope:** The goal of the headworks upgrade is to add automatic controls on gates and screens in order to improve the ability to bypass during wet weathers without interference from flows to the headworks by New Castle County. This includes more capability to bypass upstream of the bars and grit tanks with the installation of bending weirs at the grit tanks and slide gates at the bypass chamber. The upgrade improvements will allow the WWTP to achieve the full 400 mgd peak flow capacity during wet weather by maximizing the capability of the bypass. The latest WWTP headworks improvement project has been designed and bids for construction have been received. As mentioned previously, this enables the City to pump its full capacity at 11th Street of 135 MGD, since the County flows during wet weather are the predominant flow source.

**Status:** The City has substantially completed construction of the Headworks Upgrade as described in the City of Wilmington's Final Long-Term Control Plan (FLTCP) dated August 2013.

**Primary Bypass:** Despite contractual issues and concerns with premature tipping of the primary bypass bending weirs, the system has successfully been operated for the last 2.5 years. The concerns about leakage and premature tipping of the primary bending weirs has been addressed by the interim use of stop gates which are manually removed prior to a wet weather event. This has required additional manpower to place the system into service with each storm. Following each storm the stop gates have been put into place and prevented any unacceptable leakage during dry weather periods. We expect the all contractual and operational issues to be resolved in the by the end of October 2015.

**Secondary Bypass:** The secondary bypass has been successfully placed in use for approximately one year. The system automatically detects flow rates in excess of the secondary capacity and modulates the bypass gates to maximize the flow obtaining secondary treatment and minimize the duration of bypass. The SCADA system has calculated the volume of bypass flows for reporting purposes and the values have correlated well with manual calculations performed by the operators.

**Peak Flow Capacity:** As mentioned in the prior letter/section of this memo regarding the POTW headworks, the POTW headworks upgrade construction is complete. The POTW is expected to be able to achieve a peak flowrate of 400 MGD including 250 MGD of primary treatment during wet weather. The systems and elements to achieve these flowrates are in place and operating at the POTW. However, due to limitations in the collector system, most notably operational issues at the 11th St. Pumping Station the POTW has not observed/received the full peak



## CSO Program Annual Report | 2014

---

flowrate to demonstrate full hydraulic capacity. During 2014 the POTW headworks was able receive and treat all flow that was provided to it. The peak flow during this period was 310 MGD during the month of April of 2014. As the operation constraints at 11th St. Pumping Station are resolved and flows increase, the City will continue to monitor and report flow rates for the POTW. If a flow deficiency in the POTW headworks is identified once the collector system is capable of delivering 400 MGD, it will be reported and a schedule to achieve the full expected treatment rate of 400 MGD will be provided in the FLTCP CSO annual reports. Please note that the peak design capacity of the POTW is listed as 350 MGD while the maximum hydraulic capacity is estimated to be 400 MGD. The maximum hydraulic capacity is calculated utilizing the assumption that all back up pumps, screens and tanks are online.

### N4 – Kentmere & Union CSO Elimination for Average Year - Under Construction

**Deliverable:** The City will implement projects from the Kentmere & Union Plan to eliminate the Kentmere & Union CSO in the average year.

**Deadline:** October 1, 2018

**Scope:** During the course of the ELTCP a new combined sewer overflow was located at Kentmere & Union above the City's drinking water intakes. The City will implement projects from the Kentmere & Union Plan to eliminate the Kentmere & Union CSO in the average year. This may include partial sewer separation of street runoff, rainbarrel programs, or other elements to properly eliminate the overflows.

**Status:** This project is currently under construction, see N2 above.

---

### 2.3.3. STATUS AND DISCUSSION OF SEWER SEPERATION FEASIBILITY (S\_)

Sewer separation is traditionally the most expensive option to address CSO discharges in existing areas of a City. However, when large scale urban renewal projects occur, the cost may be incremental because an entire area is being developed like a new development. Therefore, large scale and long term redevelopment projects associated with urban renewal represent a significant potential opportunity for synergy with sewer separation projects. However, such separation will be weighed against the reality that it will cause an urban discharge during every rain event (since new separate storm sewer outfalls would most likely be constructed, directly or indirectly discharging to the area water bodies) as compared to the current situation where overflows are far less frequent. Additionally, expansion of the City's storm sewer system by way of CSS separation initiatives will eventually impact the City's MS4 stormwater management program.

### S1 – Wilmington Area Hospital Sewer Separation

**Deliverable:** To remove an estimated 10 acres of drainage from the CSO system. The construction will be completed and estimates of the reduction of related CSOs as will be provided.

**Deadline:** October 1, 2017

**Scope:** The Wilmington Hospital is located in the drainage area to CSO 23 at Washington Street and 14th Street and discharges into segment #34 of the Brandywine Creek. The project separates 10 acres of the Wilmington



## CSO Program Annual Report | 2014

---

Hospital property, as well as the Hercules Building, and Orange Street from the Combined Sewer System into a separate stormwater sewer. The separate stormsewer helps mitigate overflows at CSO 23. For example, for a 1" rainfall event, 272,000 gallons will be removed from the combined sewer system. Additionally, a vortex device is being installed in a diversion manhole that conveys a controlled flow of 0.1 cubic feet per sec (the first flush) to the WWTP. The design for this project is completed and construction is underway. The City will reimburse the Hospital for the sewer separation costs, estimated at \$500,000.

**Status:** The sewer separation was conducted in 2013. This area is part of a larger CSO monitoring plan the City is developing and will be monitored at a later date.

### S2 – Special Area Management Plan (SAMP)

**Deliverable:** Identify and analyze areas for potential stormwater separation from the CSO system in conjunction with large development/redevelopment activities.

**Deadline:** October 1, 2018

**Scope:** There are an estimated 47 parcels along the Christina riverfront in Wilmington. Approximately 30 of those parcels are over one acre comprising 205 of the 216 acres or roughly 95% of the riverfront area. Disconnection of 205 acres of riverfront area from the combined system to a managed and treated (anticipated to be a wetlands system) discharge into the river directly is roughly the equivalent of a 5% reduction in impervious area to the CSS. See Figure 2-1 below.

Sewer separation is often the most expensive of all the options to control CSO discharges. However, opportunities may arise during the development / redevelopment process where separation of large parcels and properties along waterfront areas or areas that can be directed downstream of the CSO regulator in order to reduce flow into the CSS. In these cases, the incremental cost of separation with the development project may be more attractive than the traditional approach or the management of the runoff due to local ordinances in CSO areas may drive a developer to separate in order to avoid costly treatment systems. This activity will be coordinated with project G2 that examines a stormwater ordinance.

This project proposes to develop a plan that identifies and prioritizes potential clusters of parcels that are over one acre with waterfront access or than can be directed to discharge downstream of the CSS regulator for stormwater separation during the future development process. The plan will also compare the potential cluster parcels with current City Plans and future planned development to identify opportunities for separation from the CSO system during construction. A workshop with other City agencies will be conducted to initialize identification of these future development areas for focused study. The plan will also examine conceptual separation designs, related cost, and technical analyses for priority areas that are linked to major development planned to begin construction during the next 3-5 years.

A good example of how these efforts can be planned to gain CSO benefits is the recent South Market Street Shoprite Project. A partial sewer separation was conducted from first phase of new development on South Market Street. The storm water was directed under South Walnut St into a plunge pool and a grass lined ditch going north towards the Christina River. The closest affected CSO is CSO #10, but this work also affects other CSO points between South Market Street and the 11th St Pumping Station. The City is working on estimating the benefits of this project.



## CSO Program Annual Report | 2014

---

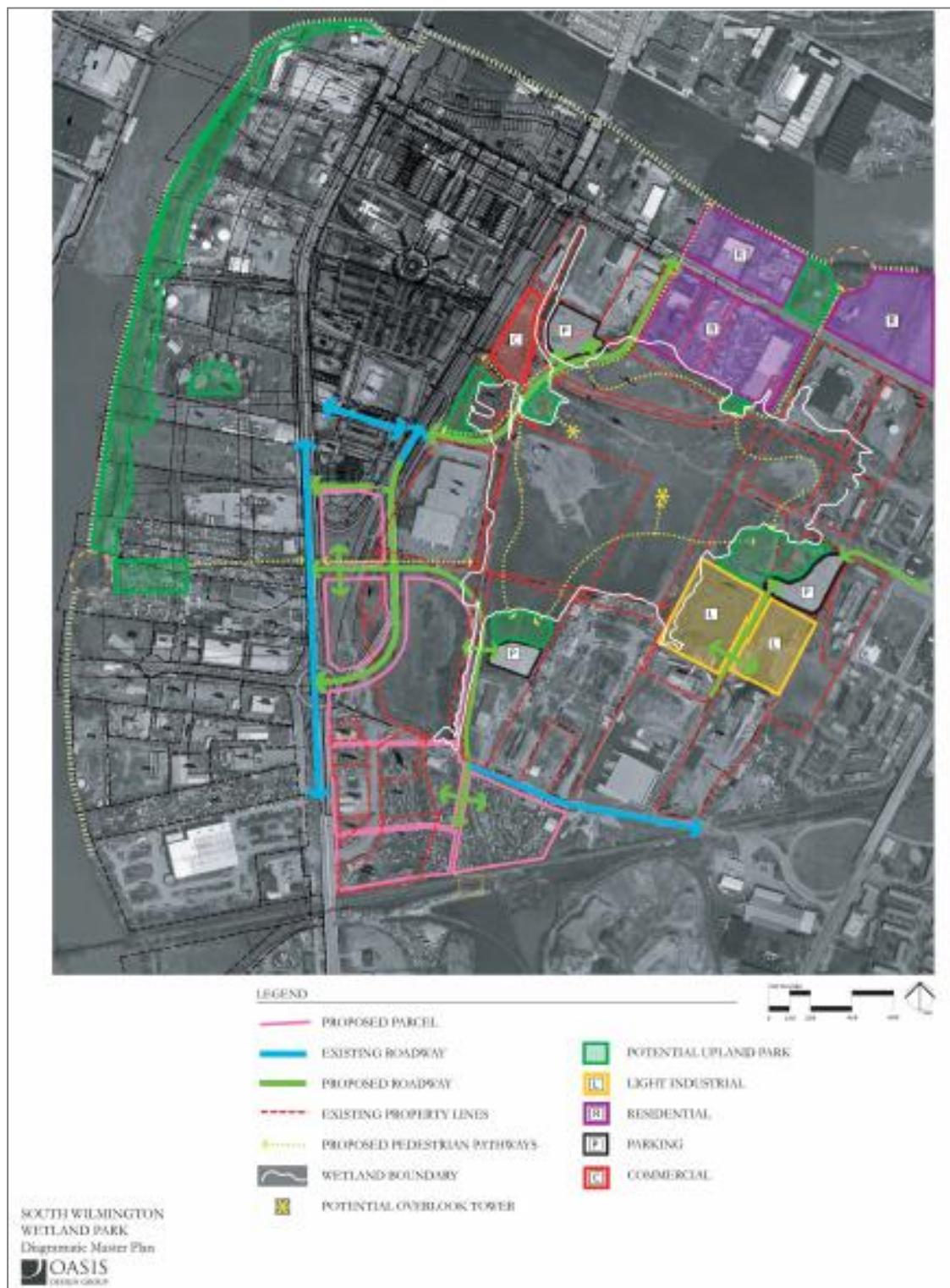
**Status:** Since the initial submission of the FLTCP the City efforts from a larger evaluation and plan have moved to an effort to implement a large sewer separation project in the South Market St. CSO #10 area. The City has developed a concept for a large stormwater wetland park area. The City has been working since 2010 to acquire the parcels and has signed a commitment agreement to purchase approximately 27 acres in 2014 pending site cleanup. Initial concept designs for the wetland park and sewer separation have been conducted with City stakeholders and once land acquisition is complete designs will begin for implementation. In the 2013 Annual Report, the City requested DNREC to allow it to concentrate its efforts on the separation project design and implementation and postpone any planning evaluations of the waterfront areas originally described. The City has not received a response from DNREC, but has proceeded with focusing efforts on separation project design.





## CSO Program Annual Report | 2014

Figure 2-1 South Wilmington Area and Potential Concepts for Sewer Separation





## CSO Program Annual Report | 2014

---

### 2.3.4. STATUS AND DISCUSSION OF SOURCE CONTROLS & GREEN INFRASTRUCTURE PROJECTS (G\_)

In this section the scope of each of the implementation projects will be described in detail and the specific deliverables to DNREC for each item.

#### G1 – Feasibility Study of Leveraging Stormwater Utility Credits to Incentivize Source Controls

**Deliverable:** A study with recommendations for the City to implement to increase source controls through its current impervious cover parcel based stormwater billing approach.

**Deadline:** October 1, 2015

**Scope:** The City of Wilmington established a stormwater utility in 2007. The stormwater utility uses a parcel based impervious cover approach to determining the stormwater bill for properties. This billing approach also currently includes a very general stormwater credit program to properties that manage their stormwater. However, the technical criteria for the billing credits could be examined to determine if they could be adjusted to be more complementary to accelerating private implementation of source controls to further enhance the Final LTCP. Technical elements such as a required management volume or rate will be examined as well as potential geographic and green infrastructure incentives. The study will also estimate the extent of area needed by credits to achieve the reductions required in the TMDL.

**Status:** Several example projects have evaluated the potential savings by stormwater credits in the stormwater charges by the City. Currently the stormwater charges by the City and potential savings by credits result in an unattractively long payback period compared to the costs of a property retrofitting. The City plans to perform a complete analysis of the data to make a determination of the effectiveness of this program.

#### G2 – Feasibility Study of Stormwater Ordinance

**Deliverable:** A study with recommendations for the City to implement some form of stormwater ordinance in order to gain additional source controls through requiring specific stormwater management controls with development and redevelopment projects.

**Deadline:** October 1, 2016

**Scope:** Nationwide many communities depend on stormwater ordinances to require stormwater management on private lands during the development and redevelopment process. In Delaware the Water Resources Protection Area (WRPA) is a good example of how ordinances can be utilized to protect water resources from degradation. In Philadelphia, over half of the Green Waters Clean City CSO Long Term Control Plan implementation success depends on stormwater management from private development.

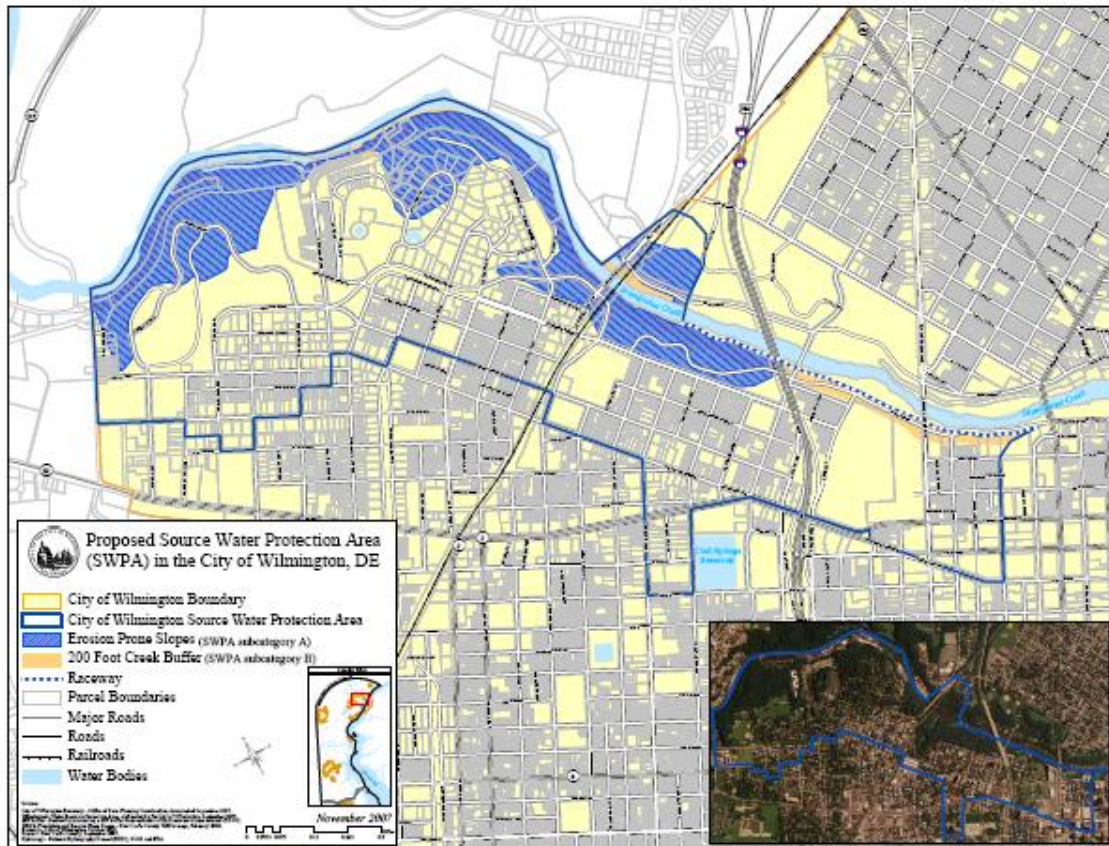
The City of Wilmington is already starting these types of activities. In 2009, the City adopted a Source Water Protection Area Ordinance in order to protect its water supply intakes that required stormwater management as well as established additional criteria protective of the water quality and quantity of the Brandywine Creek Watershed. The ordinance area covers roughly 10% of the City. As shown in Figure 2-2 below, the ordinance affects parts of the drainage areas for Interceptor A, Interceptor B, Rattlesnake Run, and the Jackson St. Drainage Area of the CSO system. Within these areas there is potential for benefit of stormwater management due to



## CSO Program Annual Report | 2014

development for CSO outfalls 24, 25, and 26 as well as the discharges at Rockford Road, and Kentmere and Union. The stormwater management requirements for development are directly linked in the ordinance to DNREC's requirements. During the next permit cycle, the City will compile and analyze the benefits of the Source Water Protection Ordinance on the CSS and relevant outfalls.

Figure 2-2 Source water protection area along Brandywine creek in Wilmington



The proposed feasibility study would expand on that effort and include examination of requirements for stormwater management on private lands due to development and redevelopment using various criteria that have been successfully employed by others and with modifications specific to the needs of Wilmington. The study will also examine the range and degree of potential impacts of such an ordinance and its requirements on business and residential sectors, the process and resources necessary by the City to administer any potential stormwater ordinance program to ensure it is implemented and enforced. The technical criteria for the stormwater management due to development could be examined to determine if they could be adjusted to be more complementary to accelerating private implementation of source controls for priorities in the Final LTCP. Technical elements such as a required disturbance thresholds, stormwater management volume or rate will be examined as well as potential geographic and green infrastructure requirements. For example, the study may suggest that instead of a citywide stormwater ordinance that it focus within particular sewersheds that contribute to the Brandywine, that particular steep sloped areas require more management, fee in lieu, trading/banking, or varying levels of earth disturbance thresholds/triggers depending on location, or that certain additional water quality





## CSO Program Annual Report | 2014

---

treatment requirements are necessary in addition to water quality management requirements depending on the location. Other options may also include having incentives that require developers with waterfront parcels or that can connect downstream of the CSS regulators to separate the stormwater produced by the development from the CSS during the development process. The study will also estimate the extent of area needed by the ordinance in order to achieve the reductions required in the TMDL and based on past development rates an estimate of the time it would take development to achieve those levels.

**Status:** The City conducted an initial analysis in 2012 of the current City codes and ordinances to determine if there are barriers to implementation of green stormwater infrastructure and opportunities to adjust ordinances and codes to incentives stormwater management with existing mechanisms. The City is currently reviewing the proposed regulations and activities related to development of a special stormwater ordinance can begin once the review is complete.

### G3 – Plan for Green Infrastructure Initiatives in Public Streets and Rights of Ways

**Deliverable:** A study with recommendations for the City to implement in order to gain additional source controls through implementing a variety of initiatives to manage stormwater from public streets.

**Deadline:** October 1, 2017

**Scope:** Nationwide many communities are implementing programs to manage stormwater from public streets using green infrastructure. The City will develop a plan that outlines the requirements, resources, and policies appropriate to facilitate the use of green infrastructure to manage street runoff. The City will examine how to develop and adopt a standard process to include green infrastructure with streetscaping or water and sewer replacement project conducted in the City which will include potential elements such as street trees, tree pits, rain gardens, or bioswales to provide additional management of stormwater. This study will include potential costs and impacts. For example it may examine the benefits of additional street trees because every tree (of a certain type) planted within 10 feet of impervious area once mature will accomplish the management of the first 1 inch of stormwater for 100 square feet of impervious area nearby.

Once the plan identifies the various ways and creates the internal City standards and processes to manage stormwater runoff from streets, a pilot program for focused green infrastructure projects within public streets will need to be developed for specific CSOs before it is adopted citywide and so that standards can be evaluated. Once the CSO outfalls have been reprioritized, the City will identify one or several CSO outfalls where green infrastructure “opportunity areas” have been identified such that stormwater from streets can be diverted away from the CSO system and effectively managed in bioswales, planters, tree pits, rain gardens, or other methods. Typically these initial opportunity areas would generally occur first in areas where there is potentially green space available for management such as near park or recreational areas. However, other opportunity areas would be sites of significant street reconstruction or streetscaping associated with a significant redevelopment or infrastructure renewal project that allows for an opportunity to provide the value added benefit of a green infrastructure element. The plan will also identify green infrastructure approaches and pilot areas sidewalks, streets, alleys, and other areas to be developed and piloted during the Final LTCP. The plan will also prioritize areas for initial projects based on opportunity and targeted initiatives due to outfall priority based on revised CSO modeling results.



## CSO Program Annual Report | 2014

---

**Status:** The City continues to move forward with the pilot plan, see CSO Program 2013 Annual Report Final Long Term Control Plan for additional information.

### G4 - Plan for Green Infrastructure Initiatives in Public Building Projects

**Deliverable:** A study with recommendations for how the City processes and standards would need to change in order to gain additional source controls through implementing a variety of initiatives to manage stormwater from public buildings and properties.

**Deadline:** October 1, 2017

**Scope:** Nationwide many communities are implementing programs to manage stormwater from public properties using green infrastructure. The City will develop a plan that outlines the requirements, resources, processes, and policies required to use green infrastructure to manage runoff from public properties during capital improvements or maintenance projects. The City will examine how to develop and adopt a standard process to include green infrastructure when feasible with every parking lot or roof replacement conducted by the City which will include potential elements such as porous pavement, green roofs, rain gardens, or bioswales to provide additional management of stormwater. This study will include potential costs and impacts.

Public buildings and parking lots are significant opportunities to implement green infrastructure elements. For example, roof replacements can incorporate portions of green roofs or parking lots can be replaced with porous pavement. Additional green elements such as bioswales, rain gardens, and tree pits can also be considered. A mixture of public street and public property activities can also be accomplished. For example, a small portion of a public park could have stormwater park elements such as swales and raingardens incorporated to take nearby street and sidewalk runoff surrounding it. The location and impervious area of these facilities in relation to priority CSOs for reductions to meet the TMDL will assist in developing a pilot area for the study and future implementation. A plan that identifies green infrastructure approaches and pilot areas for different public properties such as office buildings, parking lots, maintenance facilities, parks, recreation centers, schools, cemeteries, or other types will be developed, piloted, and initiated during the Final LTCP. The plan will also prioritize areas for initial projects based on opportunity and targeted initiatives due to outfall priority based on revised CSO modeling results. A review of the building code will be made with initiative G6 since local building requirements to accommodate green roofs will most likely require a change to building code and standards.

**Status:** Given the potential for green infrastructure to manage stormwater from both public properties, rights of ways, and private properties the City chose to pilot an integrated plan for green infrastructure in CSO4A described in the prior section above. It is believed that by working through specific project examples that policies, protocols, standards, and procedures can be developed for other public properties in the City. Thus the CSO4A pilot plan is a vehicle to initiate these discussions of public projects and stormwater management. The goal includes potential to develop a set of future policies for public properties.

### G5 - Plan for Green Infrastructure Initiatives on Private Properties

**Deliverable:** A plan with recommendations for the City to implement in order to gain additional source controls through implementing a variety of initiatives to manage stormwater on private property.

**Deadline:** October 1, 2017



## CSO Program Annual Report | 2014

---

**Scope:** The City will develop a plan that outlines the requirements, resources, and policies required to use green infrastructure to increase the management of runoff from private properties. First, the City will need to conduct an analysis of impervious areas in the watershed on private lands which identifies the categories of private lands that have the largest impervious areas. The impervious area analysis will develop the ability for prioritization and development of specific programs aimed at critical impervious areas on private or public lands. For example, it is anticipated based on studies in other large cities that roughly half the impervious area is in public areas and the other half is on private lands. The proposed ordinance and stormwater billing approaches may not be completely effective if there are specific land uses that are not impacted in certain commercial or residential classes. Therefore, depending on the landowner type, programs aimed at providing incentives, tools, or services may need to be developed. These may include enhancements to the current rain barrel initiatives in the City for residents or specific programs aimed at supporting stormwater retrofits for schools or other types of properties. Another element may be necessary to provide synergy with vacant lands. The information from the impervious area analysis will be incorporated into the development of the green infrastructure pilot program described earlier. A plan that identifies green infrastructure approaches and pilot areas for various private property types will be developed, piloted, and initiated during the Final LTCP. The plan will also prioritize areas for initial projects based on opportunity and targeted initiatives due to outfall priority based on revised CSO modeling results.

**Status:** The City is currently reviewing the proposed regulations and activities related to development of a special stormwater ordinance can begin once the review is complete.

### G6 – Study for Code Changes to Support Green Infrastructure

**Deliverable:** A study with recommendations for the City to implement in order to identify ways City codes can be adjusted to facilitate green infrastructure.

**Deadline:** October 1, 2017

**Scope:** Zoning codes, building codes, plumbing codes and other codes may have elements that can conflict with or hinder the implementation of green infrastructure. For example some plumbing codes may prevent the ability to use materials or techniques in green infrastructure or building codes may have an element that makes green roofs too expensive or not allow disconnection or exterior downspouts. Zoning codes may prevent green space for green infrastructure in certain zoning categories or not allow for exceptions in the placement of green infrastructure. A comprehensive review of the zoning, building, plumbing, and other relevant City codes will be conducted to identify potential conflicts and opportunities to facilitate green infrastructure for source controls in the City.

**Status:** Completed. The City conducted an initial analysis in 2012 of the current City codes and ordinances to determine if there are barriers to implementation of green stormwater infrastructure and opportunities to adjust ordinances and codes to incentives stormwater management with existing mechanisms. The City is continuing internal review and discussions related to the study findings.





## CSO Program Annual Report | 2014

---

### 2.3.5. STATUS AND DISCUSSION OF POST CONSTRUCTION MONITORING PLAN (P\_)

Post construction monitoring is a critical aspect of any CSO program. Post construction monitoring efforts of the Final LTCP are designed to provide data to properly benchmark and assess the implementation of projects to reduce CSO discharges. As shown, modeling will be the primary tool used to assess the elements of the Final LTCP, but discrete monitoring activities will be required to examine performance of the key CSO projects. In this section the scope of each of the projects will be described in detail and the specific deliverables to DNREC for each item.

#### P1 – Upgrade of CSS Model

**Deliverable:** A CSS Model that includes up to date impervious cover and runoff information, key CSO projects, green infrastructure modeling capabilities, etc.

**Deadline:** October 1, 2018

**Scope:** The CSS model needs to be upgraded to address new information and revised characteristics of the City's land use, rainfall data, hydraulic elements, operational techniques, source control programs. It also will require validation and calibration of the model with monitoring data that will be collected during this period as part of project P2. The CSS Model upgrade will include development of refined rainfall data and impervious cover information to address runoff generation. The hydraulic elements of the model will be revised to reflect the appropriate storage, conveyance, and flows in the system due to the ELTCP projects. The model will be revised to include the capability to estimate impacts of the proposed sewer separation and green infrastructure projects in the Final LTCP.

**Status:** The enhancement of the CSS model is currently being evaluated and planned.

#### P2 – Flow Monitoring Plan to Support CSO Model

**Deliverable:** A flow monitoring plan of the CSO discharges related to key CSO projects and CSOs that require additional attention will be submitted at the end of 2015.

**Deadline:** October 1, 2015.

**Scope:** The Flow Monitoring Plan will identify aspects of the Final LTCP that will require flow monitoring data in order to properly calibrate and validate the CSS Model. This includes specific monitoring activities to measure the performance of the key CSO projects such as the Real Time Control System and Rockford Road projects. The monitoring plan will also include focused monitoring of areas in the CSS system that require further calibration to reduce the variability and uncertainty of the CSS model.

**Status:** The City (through its consultants) has completed flow monitoring in one of the five interceptor sewersheds, the City is currently working on a plan to complete the remaining flow monitoring work within the permit period.

#### P3 – Modeling Plan to Estimate CSO % Capture and Christina TMDL Loads

**Deliverable:** A plan of modeling activities and outputs to estimate the CSO percent capture and compliance with the Christina TMDL loads will be developed.

**Deadline:** October 1, 2015.